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PATHOLOGY AND PHYSIOLOGY OF BURNS
1942-1951

An annotated bibliography
Compiled by

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Bibliographer

Washington, D. C.
June 1952

*References marked with an asterisk were not available for examination when the list was compiled. This does not necessarily mean that they are not available at Armed Forces Medical Library. Conversely, not all of the material listed without an asterisk is available at Armed Forces Medical Library.

P R E F A C E

The problem of burns continues to be of major importance. Peacetime accidents and catastrophes involving burns have not been reduced significantly; burns as war wounds have increased in number and become more serious in character; in the area of civil defense, in the atomic age, it is clear that burn casualties will far outnumber radiation casualties.

In consideration of these facts, the Armed Forces Medical Library has undertaken the compilation of this bibliography. We have had the good fortune to have as consultants Lt. Col. Edwin J. Pulaski of the Army Medical Service Graduate School, Dr. Sanford M. Rosenthal of the National Institutes of Health, and Dr. Gerard M. Turino of the National Research Council. They have stayed with the project from inception to completion, giving freely of their time, knowledge, and energy in an effort to make this compilation as useful as possible. On their advice, the scope of this list has been limited to the pathology and physiology of burns, only. Material published prior to 1942 has been excluded, due to the existence of the excellent bibliography (1320 items) contained in H. N. Harkins' Treatment of Burns (Springfield, Thomas, 1942). No limitations as to language coverage have been observed.

We have had a feeling of urgency about the production of this list; as a result, we set a target date for its completion and adjusted all other factors so that the deadline could be met, and the bibliography placed in the hands of users as quickly as possible. This has necessitated the employment of certain short-cut methods:

1) For the period 1942-1946, we have used, by permission of Dr. H. N. Harkins, the citations appended to his article on "The Treatment of Burns and Freezing" in Lewis' Practice of Surgery (Hagerstown, Prior).

2) These citations were supplemented by material taken from the Subject Index, which constitutes the unprinted portion of the Index-Catalogue of the Library of the Surgeon General's Office.

3) Limited search was made, under the subject heading Burns and its subdivisions Pathology and Physiology and corresponding headings, in the following:

Card catalog of the Armed Forces Medical Library
Quarterly Cumulative Index Medicus 1946 +
Current List of Medical Literature 1950 + (latest issue
searched April 1952)
Chemical Abstracts 1947 +
Biological Abstracts 1943 +
Bulletin Analytique (Centre National de la Recherche
Scientifique, France) 1947 +

4) Bibliographies and citations found in the articles thus located were not searched further.

5) No special search was made for abstracts of the papers listed; only those found during the ordinary search were included.

The inadequacies due to these limitations have been minimized through the generosity of Dr. Melvin H. Knisely of the University of South Carolina, Dr. H. N. Harkins of the University of Washington, and Major Curtis P. Artz and Captain Eric Reiss of Brooke Army Medical Center, who put their own personal card files at our disposal.

The bibliography has been arranged alphabetically by large subject groups, generally on the basis of the organ or system affected. Cross references have been held to a minimum. Abbreviations used for journal titles are those adopted by the Index-Catalogue.

The list itself was reproduced by photo-offset from the original cards used in collecting and annotating the material; for the difficult task of arranging the material thanks are due to Mrs. Alta Jean Stewart of the Armed Forces Medical Library staff.

FRANK B. ROGERS
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15 June 1952

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PATHOLOGY AND PHYSIOLOGY

OF THERMAL BURNS

BODY FLUIDS AND ELECTROLYTES

1. Abbott, W. E., Hirshfeld, J. W., and Meyer, F. Metabolic alterations following thermal burns. II. Changes in the plasma volume and plasma protein in the convalescent phase. Surg. Gyn. Obst., 1945, 81: 25-30. Abstracted in: Biol. Abstr., Balt., 1946, 20: No. 9798. "Following the shock phase, burned animals that were maintained on an intake of food identical with that consumed before injury show a decided rise in their plasma volumes above the normal. ... A marked increase in the total circulating plasma proteins was present although a marked negative nitrogen balance existed for 2 to 3 weeks. A moderate decrease in the plasma albumin concentration and in the total circulating albumin occurred when the plasma volume increased. A definite anemia was present in the convalescent phase because of an actual decrease in the circulating red cell mass." 33 references.
2. Abbott, W. E., Hirshfeld, J. W., Williams, H. H., Pilling, M. A., and Meyer, F. L. Metabolic alterations following thermal burns. VI. The effect of altering the nitrogen and caloric intake or of administering testosterone propionate on the nitrogen balance. Surgery, 1946, 20: 284-294. Abstracted in: Chem. Abstr., 1948, 42: 7396g. "Following a thermal injury, a fairly characteristic metabolic response is elicited which is dependent on the nature and severity of the injury and on the individual reaction of the patient (sex, age, previous nutritional state, therapy, complications, etc.)." 50 references.
3. Abbott, W. E., Meyer, F., and Hirshfeld, J. W. Alterations in the plasma volume and total circulating plasma proteins of burned animals during convalescence. Bull. Am. Coll. Surgeons, 1945, 30: 67. Abstract of a paper which was to be presented at The Forum on Fundamental Surgical Problems, Minneapolis, Minn., 1944.
4. Abbott, W. E., Meyer, F. L., Hirshfeld, J. W., and Griffin, G. E. Metabolic alterations following thermal burns. IV. The effect of treatment with whole blood and an electrolyte solution or with plasma following an experimental burn. Surgery, 1945, 17: 794-804. Dog experiments and clinical report of 8 cases. "Inasmuch as burned animals and patients usually show a marked retention of water during the postshock period, the fall in the plasma protein, chloride, and sodium concentrations often does not indicate a deficiency of these elements but rather a dilution of them. The decrease noted in the plasma albumin concentration is due not only to dilution but also to an actual decrease as shown by the fall in the total circulating plasma albumin." 26 references.

BODY FLUIDS AND ELECTROLYTES (Continued)

5. Abbott, W. E., Pilling, M. A., Griffin, G. E., Hirshfeld, J. W., and Meyer, F. L. Metabolic alterations following thermal burns. V. The use of whole blood and an electrolyte solution in the treatment of burned patients. *Ann. Surg.*, 1945, 122: 678-692. "The alterations seen in the hematocrit and in other blood constituents following a burn have been discussed. The effect of various forms of therapy on the blood chemistry has been presented. ... It is felt that the hematocrit cannot be employed as a reliable guide to the amount and type of fluid necessary for treating burned patients." 21 references.
6. Alrich, E. M. Studies on burns. II. Observations on a vasoconstrictor substance in lymph from a burned area. *Surgery*, 1944, 15: 908-912. "Evidence is presented of a vasoconstricting substance in the lymph from an experimentally burned area. It is not due to the process of coagulation since it is present when previously heparinized animals are employed. It is possible that this is the constrictor substance observed in the circulating blood by Page. The substance has not been identified nor its relation to a supposed 'burn toxemia' established." 10 references.
7. Alrich, E. M. Studies on burns. III. The effect of heparin on the circulating blood plasma and proteins in experimental burns. *Surgery*, 1949, 25: 676-680. Abstracted in: *Bull. Anal. CNRS*, 1950, 11: pt. 2, 2492. "Heparinization following a standard burn in dogs results in (1) an appreciable mortality, (2) a greater loss in plasma protein and plasma volume during the first twelve hours following burning, and (3) a greater return of lost plasma and proteins to the general circulation from twelve to thirty hours after burning than in control animals with a comparable burn." 4 references.
8. Alrich, E. M. Studies on burns. IV. Further observations on a vasoconstrictor substance in lymph from a burned area. *Surgery*, 1949, 25: 931-934. Abstracted in: *Chem. Abstr.*, 1950, 44: 9036d; *Bull. Anal. CNRS*, 1950, 11: pt. 2, 193. "With repetition of the perfused ear method, less striking evidence of a vasoconstrictor substance in lymph from burned areas was observed. This may be due to further experience with the method, resulting in less chance of error. The three other methods showed no results suggesting vasoconstrictor material in lymph from a burned area." 4 references.
9. Alrich, E. M., and Lehman, E. P. Studies on burns. I. The effect of plaster confinement applied at varying intervals after burning. *Surgery*, 1944, 15: 899-907. "Evidence is presented that plaster confinement of an experimental burn decreases the loss of plasma from the circulation. This effect depends at least to some degree on the time at which the confinement is initiated, being less evident at longer intervals after the burn. Confining dressings have a favorable effect on local tissue loss." 7 references.

BODY FLUIDS AND ELECTROLYTES (Continued)

10. Baker, J. W., Wight, A., Michel, A. J. D., and Cope, O.
A clinical and experimental evaluation of the influence of ACTH on the need for fluid therapy of the burned patient. *Ann. Surg.*, 1951, 134: 614-616. Dog and human experiments failed to show any influence of ACTH on the abnormal capillary permeability following burns. 5 references.

11. Barac, G. Effet antidiurétique du sang veineux céphalique de chien brûlé à l'égard des reins innervés. *C. rend. Soc. biol.*, 1946, 140: 1125-1127. Nine experiments with jugulojugular cross-circulation tend to show that blood from the cephalic vein of a burned dog has an antidiuretic effect on the enervated reins of the dog with whom he is permanently exchanging blood. Paper read at the meeting of the Société Belge de Biologie, March 1946. 1 reference.

12. Barac, G. Hémococoncentration, volume du plasma circulant et diurèse aqueuse chez le chien brûlé. *C. rend. Soc. biol.*, 1949, 143: 988-990. Abstracted in: *Bull. Anal. CNRS*, 1950, 11: pt. 2, 459. 5 references.

13. Barac, G. Mise en évidence de l'action antidiurétique du sang de chien brûlé à l'égard des reins innervés. *C. rend. Soc. biol.*, 1946, 140: 1107-1109. 13 experiments with cross-circulation tend to show the antidiuretic effect of the blood of a burned dog on the enervated kidney. Paper read at the meeting of the Société Belge de Biologie, January 1946. 1 reference.

14. Barac, G. Nouvelles expériences relatives à l'effet antidiurétique du sang de chien brûlé. *C. rend. Soc. biol.*, 1949, 143: 990-991. Abstracted in: *Bull. Anal. CNRS*, 1950, 11: pt. 2, 459. Added evidence supporting the hypothesis that the diuretic effect of the blood of a burned dog is not mediated by the splanchnic nervous system. 1 reference.

15. Barac, G., and Nizet, A. Altérations morphologiques des hématies de chien, chauffées in vitro, ainsi que chez l'animal brûlé. *C. rend. Soc. biol.*, 1946, 140: 1213-1215. Microcytes of varying size appear in blood heated in vitro to 50-55°. These microcytes represent altered erythrocytes. Paper read at the meeting of the Société Belge de Biologie, June 1946. 3 references.

16. Beck, W. V. Beeinflussung des Blutalkoholspiegels bei Verbrennung und Einatmung von Brandgasen. (Experimentelle Untersuchungen.) *Deut. Zschr. gerichtl. Med.*, 1940/41, 33: 95-102. At the occasion of an inquiry into an accidental death due to burning, animal experiments showed that burning and inhalation of burn gases do not affect the blood alcohol. 4 references.

17. Beecher, H. K., and McCarrell, J. D. Reduction of fluid loss from damaged (burned) tissues by a barbiturate. *J. Pharm. Exp. Ther.*, 1943, 78: 39-48. "When tissues are damaged by heat, the resulting loss of fluid and protein

BODY FLUIDS AND ELECTROLYTES (Continued)

from the burned surface can be reduced significantly by the systemic effect of a barbiturate, pentobarbital sodium ('nembutal') in sedative dose. ... Morphine has no cur-tailing effect on fluid loss as does the barbiturate." 8 references.

18. Behrmann, V. G., Schelling, V., and Hartman, F. W. Blood histamine levels in experimental burns. *Am. J. Physiol.*, 1945, 145: 483-490. Abstracted in: *Biol. Abstr.*, Balt., 1946, 20: No. 14973. "An increase in blood histamine was observed in 13 out of 14 animals burned over 50 per cent to 60 per cent of their body surface. ... The blood histamine level rose to 2.5 times the average normal figure within 24 to 48 hours after the burn, with a maximum approximately 5 times the normal figure about the fourth day. After the sixth to seventh day the level decreased gradually toward the normal. ... Our findings show no positive evidence that the elevated blood histamine levels stimulate excessive gastric acidity or play a rôle in the formation of Curling's ulcer." 15 references.
19. Bingold, K. Zum Wesen der Hämaturie nach Weichteilquetschungen (infolge von Verschüttungen) und Verbrennungen. *Münch. med. Wschr.*, 1944, 91: 39-40. In hemoglobinuria following burns the blood pigment filtered through the kidneys and excreted in the urine, has lost its catalase even though no spectroscopic changes may be observed. This blood may therefore, be completely discolored by use of H_2O_2 (=broken down to pentyopent). 3 references.
20. Bosse, M. D., Gross, P., and Hagan, M. L. Unreliability of blood findings as criteria of burn shock in rabbits. *Surg. Gyn. Obst.*, 1942, 75: 665-667. 3 references.
21. Bragagnolo, G., and Rotelli, L. Variazioni del potassio ematico negli ustionati. *Arch. ital. med. sper.*, 1947, 18: 3-12. In all second and third degree burns observed, an increase of blood potassium occurred, beginning shortly after the trauma and lasting for 3-12 days. French, English and German summaries. 21 references.
22. Braithwaite, F., and Moore, F. T. Some observations on anaemia in patients with burns. *Brit. J. Plastic Surg.*, 1948, 1: 81-86. Abstracted in: *Chem. Abstr.*, 1951, 45: 53031. In patients suffering from 3rd degree burns involving more than 15 per cent of the body surface anemia refractory to hematinic factors develops after 4-5 days. It is "related to the burnt surface; this will not heal until the haemoglobin level is over 60 per cent., and the anaemia will persist if the burn does not heal." 6 references.
23. Brown, A. Morphological changes in the red cells in relation to severe burns. *J. Path. Bact.*, Lond., 1946, 58: 367-372. Abstracted in: *Biol. Abstr.*, Balt., 1947, 21: No. 8800. "Investigation of the morphological changes occurring in the red cells of three very severely burned patients has shown that fragmentation of the red cells and microspherocytosis occur within a few hours of the injury. ... The morphological changes occurring in the

BODY FLUIDS AND ELECTROLYTES (Continued)

red cells in burns can be attributed to the direct action of heat on the cells. The maximum effect is immediate fragmentation and destruction. If the damage is less severe microspherocytosis is produced and the affected cells are unduly susceptible to the physiological trauma of the circulation. Depending on the magnitude and rate of haemolysis, haemoglobinaemia and haemoglobinuria may occur." 14 references.

24. Cameron, G. R. Sudden shifts of body fluids. Proc. R. Soc. M., Lond., 1946, 40: 1-6. Discussion of the "complicated pattern of events" observed "after the action of strong irritant liquids on the skin, thermal burning or inhalation of certain gases." 11 references.
25. Cameron, G. R., Allen, J. W., Coles, R. F. G., and Rutland, J. P. Acceleration of healing by pressure application to experimental thermal burns. J. Path. Bact., Lond., 1946, 58: 1-9. Abstracted in: Biol. Abstr., Balt., 1946, 20: No. 12067. "The prompt application of pressure bandages to thermal burns of the extremities of goats accelerates the rate of healing and greatly reduces the mean healing time. Pressure interferes with effusion of plasma and the formation of fibrin at the burn site, decreases the amount of reparative tissue and probably lessens the chance of local infection." 2 references.
26. Cameron, G. R., Allen, J. W., Coles, R. F. G., and Rutland, J. P. A study of the effects of applying pressure to experimental thermal burns. J. Path. Bact., Lond., 1945, 57: 37-46. "Goats exposed to extensive thermal burning (about 20 per cent total body surface) rapidly lose blood plasma into the burnt area. ... This is accompanied by haemoconcentration, slight transient haemolysis, slight increase in blood non-protein nitrogen, decreased plasma and total blood volume and a steady decline in the serum protein concentration. Pathological changes are slight during the first 24 hours after burning. ... Plaster pressure bandages applied to extensive burns of the extremities reduce haemoconcentration, loss of fluid and serum protein from the circulation and local oedema." 21 references.
27. Cameron, G. R., Burgess, F., and Trenwith, V. An experimental study of some effects of acute anhydraemia. J. Path. Bact., Lond., 1946, 58: 213-220. Abstracted in: Biol. Abstr., Balt., 1946, 20: No. 19537. "In an attempt to simplify the problems afforded by a thermal burn we have studied the effects produced by acute anhydraemia after the subcutaneous introduction of hypertonic solutions of glucose and sodium chloride. ... Subcutaneous injection of large amounts of hypertonic glucose or sodium chloride solutions produces severe local oedema, acute anhydraemia, haemoconcentration and circulatory collapse. A temporary disturbance of N metabolism, indicated by a rise of blood non-protein nitrogen in the absence of pronounced renal failure, and a delayed transient anaemia may follow on such conditions. Pathological changes resemble those associated with severe thermal burning. It is reasserted that many of the disturbances accompanying burning are the result of acute anhydraemia alone." 22 references.

BODY FLUIDS AND ELECTROLYTES (Continued)

28. Campbell, D. A., Gabriel, L. T., Jr., and Van Hoek, D. E.
A study of the clotting mechanism in thermal burns. Surg. Forum, Am. College of Surgeons, 1950, 515-521. Abstracted in: Chem. Abstr., 1951, 45: 97041. "While interesting changes were noted in several of the individual clotting factors, no marked defect in coagulation was observed. Therefore ... there is no reason to believe that thromboembolism in the burned patient may be expected in an incidence less than that observed in other seriously ill patients." 9 references.
29. Chanutin, A., and Ludewig, S. The effect of β -chloroethyl vesicants, thermal injury, and turpentine on plasma fibrin, cholesterol, and sugar of dogs and rats. J. Biol. Chem., 1947, 167: 313-320. Abstracted in: Excerpta med., Sect. 2, 1948, 1: 549.
30. Clark, E. J., and Rossiter, R. J. Carbohydrate metabolism after burning. Q. J. Exp. Physiol., Lond., 1943/44, 32: 279-300. Abstracted in: Biol. Abstr., 1944, 18: No. 15665. Detailed discussion of experimental hypoglycemia and of its mechanism. "It is concluded that there are at least two distinct processes at work: (a) the liberation of adrenaline from the adrenal glands; (b) some other process or processes, either stimulating hepatic glycogenolysis or inhibiting glycogenesis. The source of the glucose is chiefly the muscle glycogen, and it is suggested that it is mobilised by a mechanism similar to the Cori cycle." 70 references.
31. Comel, M. Significato clinico e prognostico dell'ipoproteinememia nell'ustionato grave. Athena, Roma, 1947, 13: 77-78. 5 references.
32. Cope, O. Anemia in burns. Surg. Gyn. Obst., 1947, 84: 999-1001. Translated in: Dia méd., B. Air., 1947, 19: 903-905. "... The origin of this internal loss or disappearance of red cells is obscure but since it appears only in patients with extensive deep burns, it is tempting to ascribe it to the infection of mixed organisms characteristic of the full thickness burn wound allowed to lie fallow and separate its slough spontaneously. ... The fate of the vanishing red cells is also obscure. ... In a patient with a severe burn the red cell formation may be reduced to less than a third of the normal." 9 references.
33. Cope, O., Graham, J. B., Moore, F. D., and Ball, M. R. The nature of the shift of plasma protein to the extravascular space following thermal trauma. Ann. Surg., 1948, 128: 1041-1055. Experimental and clinical observations. 24 references.
34. Cope, O., and Moore, F. D. The redistribution of body water and the fluid therapy of the burned patient. Ann. Surg., 1947, 126: 1010-1045. Also in: Tr. Am. Surg. Ass., 1947, 65: 630-665. "The extracellular space has been measured in a series of burned patients, patients with

BODY FLUIDS AND ELECTROLYTES (Continued)

other diseases and normal human beings, dehydrated and given therapy. The measurements have included the plasma, thiocyanate and radiosodium volumes. ... In the burned patient an expansion of the extravascular extracellular space or interstitial space is the important feature of the disordered fluid balance. ..." 32 references.

35. Cordier, D., and Pérès, G. Etude spectrale du sang à la suite des brûlures cutanées. Spectres d'absorption de l'hémoglobine dans les hématies et en solution après hémolyse. C. rend. Soc. biol., 1950, 144: 21-22. Abstracted in: Bull. Anal. CNRS, 1951, 12: pt. 2, 1589. "Burn shock does not affect the absorption spectra of Hb. Spectral analysis shows different results in traumatic shock, histamine shock, burn shock, and progressive anoxia." (Bull. Anal. CNRS).
36. Courtice, F. C. The effect of local temperature on fluid loss in thermal burns. J. Physiol., Lond., 1946, 104: 321-345. Abstracted in: Biol. Abstr., 1946, 20: No. 19539. Experiments with rabbits, dogs and goats. Contents: The effect of local temperature on the amount of oedema formation after scalding. - Effects of plasma loss on haemoconcentration and plasma proteins. - The effects of transfusion of plasma and serum. - The effects of local temperature on lymph flow from scalded paws of dogs. - The effects of local temperature on the blood flow. - The effects of decreasing blood flow in the scalded hindlegs of rabbits by tying the femoral artery. - Effect of local temperature on recovery of the capillaries after a thermal burn. - Comparison of the effects of cold and of pressure bandages. - The local loss of fluid. - The lymph and blood flow. 21 references.
37. Cullumbine, H. The influence of cutaneous burning and leukotaxine on the adenosine equivalent of the blood of rabbits. J. Path. Bact., Lond., 1947, 59: 477-479. "The adenosine equivalent in the blood of rabbits is raised to similar levels by burning the skin of the animals and by injecting them subcutaneously with amounts of leukotaxine comparable to those extracted from the burned skin." 6 references.
38. Cullumbine, H. Leukotaxine and histamine. Nature, Lond., 1947, 159: 841-842. Abstracted in: Chem. Abstr., 1947, 41: 5987c; Biol. Abstr., Balt., 1949, 23: No. 10113. Investigations of the mechanism active in the production of subcutaneous edema after cutaneous burning in the rabbit. 12 references.
39. Cullumbine, H., McDonald, F., and Simpson, M. M. The role of leukotaxine in the production of the anhydraemia of burn shock. J. Path. Bact., Lond., 1947, 59: 467-475. "Leukotaxine can be extracted from the burned skin of rabbits. The subcutaneous injection of comparable quantities of leukotaxine into normal rabbits causes marked local oedema and reproduces substantially the blood picture which follows burning, while, just as after burning, the oedema fluid it provokes after 48 hours is highly toxic." 16 references.

BODY FLUIDS AND ELECTROLYTES (Continued)

40. Demidova, P. N., Maslennikova, G. M., and Kachanova, E. V. *Morfologiya krovi pri ozhogakh*. [Blood morphology in burns.] *Khirurgia*, Moskva, 1941, No. 4, 22-26. Observations based on 670 cases. No significant changes were observed in burns of less than 10% of total body surface. Considerable changes of erythrocytes and leucocytes were found in patients with more than 20% of burned body surface. 3 references.

41. DeVries, P. J., and Albertson, H. A. Blood disturbances and anuria resulting from severe burns. *Virginia M. Month.*, 1948, 75: 173-178. Case report. 21 references.

42. Dziemian, A. The effects of burns on carbohydrate metabolism. In: *Chemical Corps and Office of the Surgeon General, Symposium on Military Physiology*, Wash., 1947. p. 251-256. "After being flame-burned, goats show a hyperglycemia, which decreases rapidly on treatment with blood or plasma. In many animals a severe hypoglycemia occurs after treatment. During the first day after burning the plasma inorganic phosphorus concentration parallels, in a rough way, the blood sugar concentration, rising initially in all burned goats, remaining elevated in the untreated animals, and decreasing gradually in the treated goats. Plasma potassium concentrations rise immediately after burning and then fall to normal or subnormal values." 7 references.

43. Edlung, T. Studies on absorption of colloids and fluid from rabbit knee joints. *Acta physiol. scand.*, 1949, 18: 1-108. See particularly Chapter V, The effect of subcutaneous inflammation, intraarticular burns, and dibenamine on the absorption of colloid and fluid from joint cavities, p. 70-86. "Intraarticular burns and subcutaneous inflammations decrease the absorption ... of hemoglobin from joint cavities with structurally intact synovial membranes." 123 references.

44. Elrod, P. D., McCleery, R. S., and Batt, C. O. T. An experimental study of the effect of heparin on survival time following lethal burns. *Surg. Gyn. Obst.*, 1951, 92: 35-42. Abstracted in: *Bull. Anal. CNRS*, 1951, 12: pt. 2, 1868. "In dosage comparable to the ordinary therapeutic regimen, heparin increased significantly the survival time of animals receiving lethal burns. The beneficial effect of heparin is accompanied by improved renal function, manifested by a statistically significant, smaller rise in non-protein nitrogen and increased urinary output, when compared to the controls. There is an apparent decrease in the expected hemoconcentration, probably due to a better return of fluid and albumin to the circulation, by way of the lymphatics." 39 references.

45. Ely, J. O. Experimental burns; a summary of work. *J. Franklin Inst.*, 1944, 237: 170-172. Abstracted in: *Biol. Abstr.*, Balt., 1946, 20: No. 19541. Contents: A. Work with rabbits. 1. Plasma calcium. - 2. Protein nitrogen and non-protein nitrogen in the serum of burned rabbits.

BODY FLUIDS AND ELECTROLYTES (Continued)

- 3. Chloride changes. - 4. Hemoconcentration. - 5. Hematocrit values. - 6. Specific gravity of the blood. - 7. Specific gravity of the plasma. B. Work with rats.
 - 1. Changes in the phosphorus content of muscle. - 2. Changes in the chloride content of muscle. - 3. The effect of the intravenous injection of laked blood on rats.
46. Ely, J. O., and Angulo, A. W. Experimental burns; the influence of a gelatin-glucose-salts solution on the hemoconcentration of burns. J. Franklin Inst., 1943, 235: 197-204. Abstracted in: Biol. Abstr., Balt., 1944, 18: No. 4235. "The effects of intravenous injections of serum, 0.85 per cent. sodium chloride solution, and GGS solution on the hemoconcentration of burns are shown ... GGS and blood serum were equally effective in combatting the hemoconcentration while 0.85 per cent. sodium chloride alone had no apparent effect."
47. Evans, E. I., and Bigger, I. A. The rationale of whole blood therapy in severe burns; a clinical study. Ann. Surg., 1945, 122: 693-705. "Blood volume determinations of severely burned patients made soon after the burn had been received indicate a decrease in total circulating red cell mass. It is believed that this initial loss of red blood cells may account for a considerable portion of the 'masked anemia' that appears in the post-shock period in many burn patients. ... If adequate amounts of whole blood are given initially in severely burned patients, secondary anemia is regularly avoided." 10 references.
48. Fox, C. L., Jr., and Baer, H. Redistribution of potassium, sodium and water in burns and trauma, and its relation to the phenomena of shock. Am. J. Physiol., 1947, 151: 155-167. Abstracted in: Chem. Abstr., 1948, 42: 1656c; Biol. Abstr., 1948, 22: No. 20822. "Tissues injured by tourniquet trauma or by scalding at 75°C. lost potassium and gained sodium in addition to a considerable gain of extracellular fluid (water and sodium). Burns produced at 94-99°C. showed no significant local fluid accumulation but tissue-cell potassium was extruded and an equivalent intracellular gain of sodium occurred. ... Death in shock was not correlated with extensive local fluid loss but with extrusion of considerable potassium from injured tissue cells and their acquisition of an equivalent amount of sodium. This exchange resulted in swelling of uninjured tissue cells throughout the body, leading to additional reduction in extracellular fluid and blood volumes." 37 references.
49. Fox, C. L., Jr., and Keston, A. S. The mechanism of shock from burns and trauma traced with radiosodium. (Abstract of Shock Report No. 54, Committee on Medical Research of the Office of Scientific Research and Development.) 11. "Standardized shock from both burns and trauma was produced by Rosenthal's technique. Isotonic saline containing radiosodium was administered therapeutically and analyses were carried out 20 hours later. ... The data indicate that there is a very great 'loss' of sodium into traumatized tissues accompanied by a marked reduction in

BODY FLUIDS AND ELECTROLYTES (Continued)

- the total volume of extracellular fluid. The circulatory collapse characteristic of shock, and the usually concomitant decrease in plasma volume, are apparently the consequence of the sharp reduction in extracellular fluid volume."
50. Fox, C. L., Jr., and Keston, A. S. The mechanism of shock from burns and trauma traced with radiosodium. *Surg. Gyn. Obst.*, 1945, 80: 561-567. "Radioactive sodium was used in mice to compare the sodium content of normal tissues and those injured by burning or by tourniquet trauma. The sodium content of injured skin and muscle is greatly increased and exceeded the gain in water (edema). This indicated that additional sodium accumulated in the intracellular compartment. ... The relationship between the reduction in plasma volume characteristic of shock and depletion of extracellular fluid is discussed." 23 references.
 51. Frommel, E., and Piquet, J. Le taux de la cholinestérase sérique chez les brûlés; le rôle protecteur de l'acide tannique, de la morphine et de la narcose. *Schweiz. med. Wschr.*, 1945, 75: 593-597. Abstracted in: *Helvet. physiol. pharm. acta*, 1945, 3: C10. While burning inhibits cholinesterase for a prolonged period scalding leaves it practically unaffected. The mechanism of this inhibition and the effects of various therapeutic agents on it are investigated in the guinea pig. Paper read at the Meeting of the Schweizerischer Verein der Physiologen und Pharmakologen, Basel, January 1945. 36 references.
 52. Gabriel, L. T., Van Hoek, D. E., Kalish, S., and Campbell, D. A. Alteration of blood prothrombin concentration following burns. *Proc. Am. Fed. Clin. Res.*, 1950, 6: 12. "In eight dogs that survived the seven-day period of observation following severe thermal burns the prothrombin concentration, as determined by the two-stage method, was slightly elevated in the first twenty-four hours and then exhibited a gradual decline." Abstract of a paper presented at the 7th Annual Meeting of the Midwestern Section, Chicago, November 1949.
 53. Georges, A. Étude de la concentration sanguine immédiate après brûlure. *Arch. internat. pharm. dyn.*, Par., 1951, 87: 275-285. Abstracted in: *Bull. Anal. CNRS*, 1952, 13: pt. 2, 260. In the rabbit, extended skin burns of 65° never cause death, but moderate local edema and general capillary vasodilatation with hemoconcentration ("choc circulatoire précoce"). 23 references.
 54. Giralaldi, E., Peterson, L. W., and Cole, W. H. Cross transfusion as a means of determining toxic factors in blood from burned animals. *Proc. Soc. Exp. Biol.*, N. Y., 1947, 66: 277-278. Abstracted in: *Biol. Abstr.*, 1948, 22: No. 15826. In experiments on transfusion of blood from burned to normal dogs, the experimental animals showed greater drop in blood pressure and higher mortality rate than dogs receiving blood from normal animals.

BODY FLUIDS AND ELECTROLYTES (Continued)

55. Gjessing, E. C., and Chanutin, A. An electrophoretic study of plasma and plasma fractions of normal and injured rats. *J. Biol. Chem.*, 1947, 169: 657-665. "The electrophoretic analyses for the plasma and fractions of control and burned rats are given. Thermal injury gives rise to an increase in the concentrations of α - and β -globulins and a decrease in the γ -globulin and albumin." 6 references.

56. Glenn, W. W. L., Peterson, D. K., and Drinker, C. K. The flow of lymph from burned tissue, with particular reference to the effects of fibrin formation upon lymph drainage and composition. *Surgery*, 1942, 12: 685-693. "A simple method of making a standard burn by immersion of the foot of an anesthetized dog in boiling water is described. The effects of coagulation of the exudate caused by the burn are described. The failure to prevent collapse and death by blocking lymph flow is mentioned and will be discussed further in future papers." 4 references.

57. Gordenko, A. N. Izmenenie krovi pri ozhogovom shoke. [Blood changes in burn shock.] *Biull. eksp. biol. med.*, 1945, 19: 39-42. Dog experiments. 4 references.

58. Gordon, R. A. The significance of blood changes in the treatment of the burned patient. *Current Res. Anesth.*, 1945, 24: 78-84.

59. Gordon, S. D., and Gordon, R. A. Blood changes following thermal burns. *J. Canad. M. Serv.*, 1944, 1: 312-320. Contents: Haemoconcentration. - Red blood cells and haemoglobin. - Leucocytes. - Plasma protein. - Plasma chlorides. - Blood urea. 12 references.

60. Gromakovskaja, M. M., and Kaplan, L. E. Biologicheskie svoistva krovi i spinnomozgovoï zhidkosti pri travmaticheskom shoke, oslozhnennom ozhogami. [Biological properties of blood and cerebrospinal fluid in traumatic burn shock.] *Biull. eksp. biol. med.*, 1943, 15: 12-16. Animal blood and CSF have a histamine-like effect on the isolated stomach.

61. Ham, A. W. Experimental study of the histopathology of burns; with particular reference to sites of fluid loss in burns of different depths. *Ann. Surg.*, 1944, 120: 689-697. "The dilatation and congestion of both the smaller and larger blood vessels associated with the various types of burns studied in these [hog] experiments, together with the small hemorrhages that were not infrequently observed, serves to emphasize that extensive burns would tend to abstract significant quantities of whole blood from active circulation in addition to the plasma that is lost by leaking away from the smaller vessels." 1 reference.

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BODY FLUIDS AND ELECTROLYTES (Continued)

- of erythrocytes; observations on the mechanisms of destruction of such erythrocytes in dogs and in a patient with a fatal thermal burn. Blood, N. Y., 1948, 2: 373-403. 40 references.
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64. Hoet, J. P., Buisseret, J., and Vandenbroucke, J. Le taux de prothrombine dans les brûlures. C. rend. Soc. biol., 1945, 139: 86-87. Prothrombin studies in 16 patients. 1 reference.
65. Hoppe-Seyler, A., and Schümmelfeder, N. Das Vorkommen von Acetylcholin im Blut nach experimentellen Verbrennungen. Zschr. Naturforsch., 1946, 1: 696-699. Abstracted in: Biol. Abstr., 1948, 22: No. 15834; Chem. Abstr., 1947, 41: 5213e. "Expts. on dogs indicate that the appearance of acetylcholine in the blood is a consequence, and not cause, of the circulatory disturbances of shock." (Chem. Abstr.). 13 references.
66. Jadoul, P., and Jadoul, V. L'hyperthermie dans les brûlures expérimentales. Arch. internat. pharm. dyn., Par., 1946, 73: 106-112. Heating of blood in rabbits to a temperature equivalent to an 80° fatal burn neither causes death nor provokes any serious disturbances. 11 references.
67. James, G. W., III, Purnell, O. J., and Evans, E. I. The anemia of thermal injury. I. Studies of pigment excretion. J. Clin. Invest., 1951, 30: 181-190. Abstracted in: Chem. Abstr., 1951, 45: 3934h; Bull. Anal. CNRS, 1951, 12: pt. 2, 2481. "Hemolysis, as judged by fecal urobilinogen excretion compared to total circulating hemoglobin, occurs in burns of all degrees. It is very great in third degree burns of more than 20 per cent. ... Additional evidence is presented to show that the anemia of thermal burns is at first hemolytic, then dyshemopoietic." 21 references.
68. James, G. W., III, Purnell, O. J., and Evans, E. I. The anemia of thermal injury. II. Studies of liver function. J. Clin. Invest., 1951, 30: 191-199. Abstracted in: Chem. Abstr., 1951, 45: 3934h. "Minor to extensive third degree burns show early impairment of the liver function. ... One of the most constant changes was the increase in urine urobilinogen excretion and alterations in the albumin-globulin ratio. ... Autopsy material on five fatal burns showed no constant histopathological change, but there was evidence of fatty infiltration, cloudy swelling, increased pigments in the reticulo-endothelial cells, focal necrosis, and congestion in the liver substance. ..." 19 references.

BODY FLUIDS AND ELECTROLYTES (Continued)

69. Kay, J. H., and Delancey, H. The evaluation of cortisone, thromboplastin and inositol phosphatide in the therapy of severe experimental burns in rats. In: Am. Coll. Surgeons, Surgical forum. Phila., 1952. p. 514-517. "In experimental burns in rats, cortisone administered in doses of 20 mg. per kilo per day for three days prior to burning produced no increase in survival rate and may have significantly increased the mortality rate. Thromboplastin in doses which were nearly toxic or toxic, decreased the mortality rate in severely burned rats. Inositol phosphatide, a thromboplastin inhibitor, did not influence the mortality rate." 3 references.
70. Kendall, R. E. The laboratory in the burn catastrophe. Occup. Med., 1946, 1: 112-115. Abstracted in: Biol. Abstr., Balt., 1946, 20: No. 17589. "The immediate problem of the laboratory during the first seventy-two hours of a burn catastrophe is to estimate the hemoconcentration, which is the significant measurable characteristic of burn shock. ... An improvised setup for the securing of specific gravities by the copper sulfate falling drop technic was of assistance in the circus disaster in estimating burn shock. ... It offers a simple, rapid and, in our experience, reliable guide to hemoconcentration in burn shock."
71. Langohr, J. L., Rosenfeld, L., Owen, C. R., and Cope, O. Effect of therapeutic cold on the circulation of blood and lymph in thermal burns. Arch. Surg., 1949, 59: 1031-1044. "Exposure to cold alters the pattern of lymph flow and protein concentration... Cold does not alter the pattern of arterial blood flow in the burned foot until removal of the foot from the cold bath is effected." 18 references.
72. Lischer, C., and Elman, R. Experimental burns. II. Effect of elastic pressure applied to a burned area. War Med., Chic., 1943, 3: 482-483. "Experimental evidence is presented which indicates that in dogs the use of local elastic pressure in burns lowers the degree of hemoconcentration, as indicated by hematocrit readings, lessening thereby the loss of fluid beneath the burned surfaces. However, the mortality rate was not altered by such treatment." 8 references.
73. Lischer, C., Elman, R., and Davey, H. W. Experimental burns. III. Changes in plasma albumin and globulin. War Med., Chic., 1944, 5: 43-45. Abstracted in: Biol. Abstr., 1945, 19: No. 10161. "During experimental burns producing only an edema of the skin of dogs the concentration of serum albumin tends to fall. The globulin fraction also falls in relatively less severely burned animals which survive, but it rises, often to high levels, in fatally burned animals or in animals subjected to higher thermal stimuli. In thermal burns of 100 C. the diagnosis of hemoconcentration from the hematocrit value may be masked because of hemolysis." 4 references.

BODY FLUIDS AND ELECTROLYTES (Continued)

74. McCarthy, M. D., and Parkins, W. M. Comparative effectiveness of albumin, globin, hemoglobin, gelatin, oxypolygelatin, saline, Ringer's blood and plasma upon the survival of rats subjected to standardized scald burns. *Am. J. Physiol.*, 1947, 150: 428-443. Abstracted in: *Biol. Abstr.*, 1948, 22: No. 8428. "In general hemoconcentration was somewhat greater in animals which succumbed than in those which survived. However, the cell:plasma ratio was not of value in the prognosis of individual animals nor in comparing infusion fluids. The solutions which provided the most hemodilution did not always promote higher survival rates, whereas many animals with severe hemoconcentration in certain of the infusion groups did survive. Hemoconcentration and plasma volume do not appear to be critical factors in the survival of the rats after thermal injury of the type produced." 12 references.
75. McCarthy, M. D., and Parkins, W. M. Comparative efficacy of blood from normal and from burned donors in experimental burns. *Arch. Surg.*, 1946, 52: 570-576. "Rats subjected to a standardized scald burn were infused with postburn whole blood and normal whole blood. The survival rates of these animals were compared with those of simultaneous untreated controls. The group infused with the postburn blood showed a survival rate similar to that of the untreated group. The animals infused with the normal blood showed a significantly higher survival rate than either of the other two groups. Hematocrit data were obtained from all groups." 11 references.
76. McCleery, R. S., Schaffarzick, W. R., and Light, R. A. An experimental study of the effect of heparin on the local pathology of burns. *Surgery*, 1949, 26: 548-564. Abstracted in: *Chem. Abstr.*, 1950, 44: 9053d. The blood supply subjacent to a burn returns to normal by the fifth to seventh days in the control group and by thirty-six to seventy-two hours in the heparin group. This fundamental difference seems to produce a marked enhancement of the speed and effectiveness of the repair mechanisms in the heparinized animals. On the fifth day the heparin group is generally at a similar point reached on the ninth day by the controls." 6 references.
77. MacDonald, A. H., Levenson, S. M., Davidson, C. S., Tagnon, H. J., and Taylor, F. H. L. Studies on the peripheral blood in patients with thermal burns. 1. Thrombocytopenia. *Science*, 1944, 99: 519. Abstracted in: *Biol. Abstr.*, Balt., 1944, 18: No. 18845. "The blood platelets, counted by a direct method, were followed on 13 patients with thermal burns. ... No decrease in platelets was observed in one patient, who died 7 hours after the burn. ... In 12 cases, a decreased platelet count was observed 7 to 57 hours after the burn. The lowest counts obtained occurred within 23 to 96 hours after injury and ranged from 9,000 to 96,000 per cu. mm. Six of these patients died within 4 days. ... In the remaining six, the platelets returned to a normal level in from 4 to 9 days. However, death occurred subsequently in all but one case." 1 reference.

BODY FLUIDS AND ELECTROLYTES (Continued)

78. Monsaingeon, A., and Hurlé, A. Contribution à l'étude de l'anémie des brûlés. Presse méd., 1948, 56: 790-791. A case report is used for demonstration of the preponderant rôle of non-regeneration of erythrocytes in burn anemia. A hypothesis is presented ascribing the destruction of corpuscles to the alarm reaction. 6 references.
79. Moore, F. D., and Cope, O. Fluid and protein shifts in severely burned patients. Bull. Am. Coll. Surgeons, 1945, 30: 65. "Measurements of plasma, red cell mass, and interstitial fluid volumes have been carried out in a series of burned patients, using various techniques. ... By combining values for plasma protein concentration with the above measurements, it is possible to get an overall picture of the shifts of water, red cells, and protein in these patients." Abstract of a paper to be presented at the Forum on Fundamental Surgical Problems, 1944.
80. Moore, F. D., and Langohr, J. L. Water and electrolyte metabolism in burned patients. J. Clin. Invest., 1946, 25: 930. Experiments demonstrate "an early and persistent expansion of the extracellular space, an early negative potassium balance with positive sodium balance reversing itself after 48 to 72 hours, and an ingress of sodium into the cells of burned skin. These changes divide themselves into two phases, an early 'shock phase' and a subsequent water retention phase." Abstract of a paper read at the 38th Annual Meeting of the American Society for Clinical Investigation, May 1946.
81. Moore, F. D., Langohr, J. L., Ingebretsen, M., and Cope, O. The role of exudate losses in the protein and electrolyte imbalance of burned patients. Ann. Surg., 1950, 132: 1-19. Abstracted in: Bull. Anal. CNRS, 1951, 12: pt. 2, 1241. "Balances of nitrogen, sodium, potassium and chloride have been measured in lightly and severely burned patients. Exudate loss of these substances has been measured by analysis of dressings and beddings; these measurements ... are of fundamental importance to any evaluation of the metabolic state of burned human beings. The balance, the role of the exudate loss, and the interrelationships of nitrogen, sodium potassium and chloride metabolism in such patients have been discussed and interpreted in the light of the above findings." 12 references.
82. Moore, F. D., Peacock, W. C., Blakely, E., and Cope, O. The anemia of thermal burns. Ann. Surg., 1946, 124: 811-839. "An anemia of varying severity may be present in burned patients. ... This anemia has been investigated by serial studies of the red cell mass and bone marrow activity, employing a radioactive isotope of iron and by measurements of pigment excretion. The anemia is found only in patients with full-thickness burns. ..." 17 references.

BODY FLUIDS AND ELECTROLYTES (Continued)

83. Moyer, C. A., Collier, F. A., Iob, V., Vaughan, H. H., and Marty, D. A study of the interrelationship of salt solutions, serum and defibrinated blood in the treatment of severely scalded, anesthetized dogs. *Ann. Surg.*, 1944, 120: 367-376. "The purposes of these experiments are as follows: 1. To correlate body loads of various salt solutions and plasma with length of life and changes in other easily measurable physiologic constants that follow a scald; 2. to attempt a comparative evaluation of the relative rôles played by salt solutions, cell-free blood components, and whole blood in permitting immediate recovery from injury (74 to 100 hours following the trauma); 3. to correlate the gross and histologic, pathologic findings with the forms of therapy; and 4. to determine, if possible, whether or not any causal relationship exists between the type of therapy and the so-called 'toxemic' stage of thermal injury." 18 references.
84. Muus, J., and Hardenbergh, E. The oxygen consumption of normal rat liver slices in serum and in lymph taken from the legs before and after severe burns. *J. Biol. Chem.*, 1944, 152: 1-8. Abstracted in: *Biol. Abstr.*, Balt., 1944, 18: No. 10129. "Lymph was collected from the legs of calves under nembutal anesthesia before and after burning by immersion in boiling water for 3 to 3-1/2 minutes. ... The Q_{O_2} in lymph after burning was as much as 41 per cent higher than that in normal lymph. Less consistent results were obtained with serum collected before and after burning, but here too the tendency was towards a higher oxygen consumption in the serum after burning." 12 references.
85. Muus, J., Hardenbergh, E., and Drinker, C. K. The oxygen consumption of normal rat liver and diaphragm muscle in lymph taken from dogs before and after severe burns. *Am. J. Physiol.*, 1944, 142: 284-289. Abstracted in: *Biol. Abstr.*, Balt., 1945, 19: No. 6227. "A technique whereby it is possible to collect 10 to 15 cc. of normal lymph from the hind legs of dogs without the use of an anticoagulant is described. The lymph collected from this area after it had been severely burned was shown to increase the oxygen consumption of rat liver slices as compared with slices from the same liver in normal lymph. Such an effect had previously been demonstrated for calf lymph. The lymph from the burned legs was found to cause a similar increase in the oxygen consumption of rat diaphragm muscle." 4 references.
86. Ojetti, F. Osservazioni sul comportamento del potassio tissulare nelle ustioni. *Athena, Roma*, 1942, 11: 4-5. Burned tissue of rabbits presented a considerable loss of potassium.
87. Perlmann, G. E., Glenn, W. W. L., and Kaufman, D. Changes in the electrophoretic pattern in lymph and serum in experimental burns. *J. Clin. Invest.*, 1943, 22: 627-633. Abstracted in: *Biol. Abstr.*, 1944, 18: No. 2268. "Normal lymph has the same four electrophoretic components as are present in serum: albumin, α -, β -, and γ -globulin. The

BODY FLUIDS AND ELECTROLYTES (Continued)

pattern obtained from lymph derived from the burned tissue revealed the occurrence of an additional boundary, migrating with half the speed of the γ -globulin. The changes found in serum indicated a slight decrease of the albumin:globulin ratio with an increase in the α -globulin fraction." 13 references.

88. Piccinini, P., and Bonaccorsi, R. Il tempo di coagulazione del plasma (tasso di protrombina) in alcuni individui ustionati. Progr. med., Nap., 1946, 2: 641-642. Observations made in 4 cases in all of which plasma prothrombin fell to 50-60% of normal, with a corresponding increase in coagulation time. 2 references.
89. Pirani, F. Azione protettiva del siero degli ustionati nell'emolisi fotodinamica. Boll. Soc. ital. biol. sper., 1951, 27: 125-127. Abstracted in: Bull. Anal. CNRS, 1952, 13: pt. 2, 260. Blood taken from burned subjects has smaller protective power than normal blood. The decrease is proportionate to the seriousness of the burn and parallel to the decrease in blood proteins. 3 references.
90. Ponsold, A. Die Bluteindickung beim Verbrennungsspätstod. Deut. Zschr. gerichtl. Med., 1941, 35: 75-82. Abstracted in: Zbl. allg. Path., 1943, 81: 147. Blood contained in the right heart has been examined because only there, changes occurring in vivo can be determined independently of post mortem symptoms. Hemoconcentration corresponding to a plasma loss of up to 2:1 was observed. The only other investigations of this type were made by Tappeiner (1881) and Zinck (1940). 8 references.
91. Prinzmetal, M., Bergman, H. C., and Kruger, H. E. Demonstration of toxic factor in the blood of rats shocked by burn. J. Clin. Invest., 1946, 25: 781-784. Abstracted in: Biol. Abstr., 1947, 21: No. 13729. "A simple physiologic method of renal perfusion is described. Perfusion of the normal rat's kidney with blood taken from a burned rat reproduces the toxic capillary atony which is characteristic of burn shock." 14 references.
92. Rhineland, F. W., Langohr, J. L., and Cope, O. Explorations into the physiologic basis for the therapeutic use of restrictive bandages in thermal trauma; an experimental study. Arch. Surg., 1949, 59: 1056-1069. Dog experiments. "Although the increased flow of lymph from the burn is reduced toward normal, it is not sufficiently reduced to permit the lymphatic vessels to carry the load, and edema piles up. ..." Plasma volume loss may remain unaffected while protein concentration in lymph "flowing from the bandaged foot is slightly higher. ... Venous pressures, arteriovenous oxygen differences and arterial blood flow were not altered by the plaster bandage. ... The possible benefits and limitations of restrictive dressings are discussed." 9 references.

BODY FLUIDS AND ELECTROLYTES (Continued)

93. Rose, B., and Browne, J. S. L. Studies on the blood histamine in cases of burns. *Ann. Surg.*, 1942, 115: 390-399. "Studies on the blood histamine, hemoglobin, hematocrit and plasma proteins have been made in seven patients following severe burns. It has been shown that a marked increase in the blood histamine occurs in certain cases within one hour after the burn. In all cases, there is a decrease in the blood histamine as toxemia and edema appear. As the edema and signs of toxemia disappear with the clinical improvement of the patient, the blood histamine rises to normal or higher levels." 32 references.
94. Rosenthal, S. M., and Tabor, H. Electrolyte changes and chemotherapy in experimental burn and traumatic shock and hemorrhage. *Arch. Surg.*, 1945, 51: 244-252. 33 references.
95. Rosin, Ia. A., and Gromakovskaia, M. M. Vliyanie spinno-mozgovoi zhidkosti i krovi, vzyatykh pri shoke, oslozhnennom ozhogami, na reflektornuyu vozbudimost. [Effect of cerebrospinal fluid and blood taken during burn shock on reflex excitability.] *Biull. eksp. biol. med.*, 1943, 15: 9-12.
96. Rossiter, R. J. Controlled external pressure and oedema formation. *Lancet, Lond.*, 1944, 1: 9-11. "External pressures of the order of 10 mm. Hg applied in an air cuff greatly reduced oedema formation in burnt guinea pig skin. The pressure is most effective if applied immediately after burning. Neither tannic acid (20%), tannic acid (10%) followed by silver nitrate (5%), gentian-violet (2%), nor triple dye, influences the formation of oedema. Similar pressures applied in an air cuff greatly reduce oedema formation in the burnt ear of a rabbit." "Note" by R. A. Peters. 12 references.
97. Rossoni, V. Il comportamento dei grassi nelle ustioni. *Clinica, Bologna*, 1945-46, 10: 50-54. Rabbit experiments did not show any changes in the fatty acids of the blood whereas there was a distinct increase in cholesterol. 16 references.
98. *Sabatini, C. Il comportamento della lipasi ematica negli ustionati gravi. *Arch. ital. derm.*, 1951, 24: 241-245.
99. Sacher, H. Das Verhalten von Blutsenkungs- und Leukozytenkurve bei der Verbrennung. *Osterr. Zschr. Kinderh.*, 1948, 1: 348-356. Both curves are uncharacteristic in light cases; in grave cases, the leukocytes curve regularly goes down from high values to the norm while the blood sedimentation curve rises up to the time of convalescence. The curves cross each other between the third and eighth day. 20 references.

BODY FLUIDS AND ELECTROLYTES (Continued)

100. Salzberg, A. M., and Evans, E. I. Blood volumes in normal and burned dogs; a comparative study with radioactive phosphorus tagged red cells and T-1824 dye. *Ann. Surg.*, 1950, 132: 746-759. Also in: *Tr. Am. Surg. Ass.*, 1950, 68: 425-438. Abstracted in: *Bull. Anal. CNRS*, 1951, 12: pt. 2, 1242. "The radiophosphorus dilution technic demonstrates an average loss of 11 per cent of the circulating red cell mass at the sixth hour following a standard 20 per cent burn. It is suggested again that whole blood be used in the early post-burn period to replace the entire calculated red cell loss." 13 references.
101. Schümmelfeder, N. Untersuchungen über Cholinesterase im Blut nach experimentellen Schädigungen. III. Mitteilung. Verhalten der Cholinesterase im Blut von Hunden bei experimenteller Verbrennung. *Arch. exp. Path., Lpz.*, 1947, 204: 567-570. In 4 dogs, the change of cholinesterase activity in whole blood and serum during extensive quickly fetal burns was investigated. Results in whole blood varied, but in 2 experiments pronounced increases occurred. In the serum, however, activity increased in all cases by 21-29%. 11 references.
102. Schümmelfeder, N. Untersuchungen über Cholinesterase im Blut nach experimentellen Schädigungen. IV. Mitteilung. Das Verhalten der Cholinesterase im Blutserum nach örtlicher Verbrennung. *Arch. exp. Path., Lpz.*, 1947, 204: 626-630. After serious local burns in dogs, death occurred accompanied by symptoms of primary shock and decrease of blood pressure. Cholinesterase activity increased during burning in all animals and continued to increase afterwards in less traumatized animals while cholinesterase values decreased in more extensively injured dogs before death. These changes were considered as an expression of the circulatory function of cholinesterase. 9 references.
103. Scudder, J., and Elliott, R. H. E., Jr. Controlled fluid therapy in burns; case report illustrating severe hemoconcentration, electrolyte changes, and the futility of formulas in replacement therapy. *South. M. and S.*, 1942, 104: 647-658. Case report with detailed blood studies. 53 references.
104. Sérafino, X. Le syndrome protido-liquidien des brûlés et son évolution. *Marseille méd.*, 1949, 86: 420-431. Abstracted in: *Bull. Anal. CNRS*, 1950, 11: pt. 2, 925. The following factors are discussed: "The preponderance of protein disturbances within a complex biochemical syndrome. - Intricacies of protein and fluid changes. - Probable existence of abnormal metabolites. - Pathogenic importance of these abnormalities." Diagnostic and therapeutic difficulties.
105. Sevitt, S. Eosinophil and other leucocyte changes in burned patients. *Brit. M. J.*, 1951, 976-983. Contents: The burned patients [35]. - Methods. - Eosinophils. - The post-burn fall. - Period of eosinopenia. - Post-eosinopenic rise. - Early eosinophilia in burns. - Later eosinophil changes. - Late eosinophilia in burns. - Lymphocytes.

BODY FLUIDS AND ELECTROLYTES (Continued)

- Neutrophils. - Eosinopenia and adrenocortical hyperactivity in burns. - Adrenocortical failure in burns. - The eosinophil changes in fatally burned patients. - Steroid therapy in burns. - Hyperactivity and failure of adrenal cortex and the period of eosinopenia. 42 references.

- 106. Shen, S. C., and Ham, T. H. Studies on the destruction of red blood cells. III. Mechanism and complications of hemoglobinuria in patients with thermal burns; spherocytosis and increased osmotic fragility of red blood cells. *N. England J. M.*, 1947, 229: 701-713. Abstracted in: *Biol. Abstr.*, Balt., 1944, 18: No. 8130. 49 references.

- 107. Silvestri, U. Su l'emolisi fotodinamica (E. f.) negli ustionati. *Boll. Soc. ital. biol. sper.*, 1949, 25: 752-753. Abstracted in: *Bull. Anal. CNRS*, 1950, 11: pt. 2, 1673.

- 108. Stephenson, K. L. The effect of hyaluronidase and plasma administered subcutaneously to burned rats. *Surgery*, 1951, 30: 845-849. "... The subcutaneous administration of plasma with or without hyaluronidase is of no value in the treatment of the burned animal in the acute phase, and suggest that such a procedure may even be dangerous and contraindicated. After the initial shock period, and period of fluid and electrolyte derangement, hyaluronidase and the subcutaneous administration of plasma may have a place in the therapeutic plan of protein restoration. The status of the usefulness of the enzyme in this later period is not established." 20 references.

- 109. Stolfi, G. Studi sperimentali sulle ustioni. *Ann. ital. chir.*, 1942, 21: 543-566. Detailed studies on blood chemistry of rabbits. Review of literature. 63 references.

- 110. Stoner, H. B., and Green, H. N. The effect of fatal cutaneous burns on the adenosine equivalent of the blood of rabbits. *J. Path. Bact.*, Lond., 1949, 61: 114-116. Abstracted in: *Chem. Abstr.*, 1949, 43: 9208b; *Bull. Anal. CNRS*, 1950, 11: pt. 2, 705-706. "Severe scalding causes a statistically significant increase in the adenosine equivalent of the blood of the rabbit. The injection of a dose of adenosine triphosphate which kills the animal in a similar period of time gives a similar rise in the adenosine equivalent of the blood." 5 references.

- 111. Stüttgen, G. Die Beeinflussung der Cholinesterase im Serum des menschlichen Blutes durch Pyriker und U.-V.-Bestrahlung, besonders im Hinblick auf die Therapie einzelner Dermatosen. *Klin. Wschr.*, 1947, 24/25: 758-759. Abstracted in: *Chem. Zentr.*, 1947, 2: 1001. Discussion includes the lowered activity of cholinesterase following burns.

- 112. Tanamura, H. Effects of burns on the blood constituents and on blood-clotting time. *Jap. J. M. Sc.*, 1944, 5: 91-99. Abstracted in: *Chem. Abstr.*, 1950, 44: 36026. Rabbit experiments. Changes in clotting time, serum

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protein concentration, fibrinogen content, hemoglobin concentration and specific weight. Original not available at Army Medical Library.

113. Taylor, F. H. L. Studies on the peripheral blood in patients with thermal burns. Thrombocytopenia. Wash., 1944. (National Research Council, Blood Substitutes Report No. 37.) 11. "The cause of the thrombocytopenia and its possible role in the complication of burns is at present under investigation. ... The occurrence of low platelet counts in burned patients gives rise to the possibility of increased bleeding tendencies in such patients. ..."
114. Taylor, F. H. L., Levenson, S. M., and Adams, M. A. Abnormal carbohydrate metabolism in human thermal burns. N. England J. M., 1944, 231: 437-445. Abstracted in: Biol. Abstr., Balt., 1945, 19: No. 2352. "In a study of 35 consecutive burned patients, a high incidence of hyperglycemia, lacticidemia and a moderate reduction in the carbon dioxide combining power of the plasma were found. There is a high degree of correlation between these abnormalities of carbohydrate metabolism and the severity of the burn. ... There was no evidence of liver damage in these patients as a result of the burn injury." 51 references.
115. Tenery, R. M. Extensive cutaneous burns; with special reference to the blood chemical changes. Surg. Gyn. Obst., 1941, 72: 1018-1027. "... Under the usual mode of therapy (intravenous plasma and saline) the toxic symptoms may develop and cause death without marked changes in the blood electrolyte pattern. The exception to this may be sodium which is definitely lowered. ... We do not imply that blood electrolyte changes are of no importance following burns; such changes must be carefully watched and controlled." 32 references.
116. Trumper, M. The potassium factor in deep burns. Surg. Clin. N. America, 1951, 31: 1551-1563. Discussion includes: The potassium factor in deep and extensive thermal burns. 30 references.
117. Van Deyn, J., II. Degenerative white blood cell picture as an indication of toxemia from burns. Arch. Surg., 1945, 50: 242-252. Report of 6 cases. "An inhibitory effect on the leukopoietic system [is] frequently demonstrable in burns. ... [It] is characterized by 'degenerative' changes in the white blood cells ... a result of toxic inhibition. There is, therefore, a true toxemia in burns, distinct from trauma and hemoconcentration, on the one hand, and sepsis, on the other, and due to the absorption of some toxic substance from the burn area." 59 references.
118. Vittorio, R. Il comportamento dei grassi nelle ustioni. Clinica, Bologna, 1945/46, 10: 50-54. In various types of burns inflicted upon rabbits, the fatty acids in the blood were not affected, whereas the cholesterine contents increased considerably. 16 references.

BODY FLUIDS AND ELECTROLYTES (Continued)

119. Walker, J. M. Potassium: burns. In: Pennsylvania University Graduate School of Medicine, *Advances in Medicine and Surgery*, Philadelphia, Saunders, 1952. p. 115-118. Rat experiments. Review and own observations.
120. Wardlaw, H. S. H. Biochemical observations on casualties burned in a petrol explosion. *Med. J. Australia*, 1950, 2: 899-902. Contents: Volume of urine. - Specific gravity of urine. - Chloride output. - Total nitrogen output. - Output of protein. - Output of 17-ketosteroids. Detailed table representing 6 cases. 9 references.
121. Weil, P. G., and Browne, J. S. I. Changes in blood histamine following burns, surgical operations and hemorrhage. *J. Clin. Invest.*, 1942, 21: 645. Abstracted in: *Biol. Abstr.*, Balt., 1943, 17: No. 2087. "In general, the results suggest that a fall of blood histamine occurs in conditions in which a transfer of fluids to extravascular spaces is occurring and a subsequent rise in blood histamine takes place when fluid is being transferred in the opposite direction. The possible significance of these findings is discussed." Abstract of a paper read at the 34th Annual Meeting of the American Society for Clinical Investigation, May 1942.
122. Weiss, D., and Haines, K. E. Burn trauma precipitating acute leukemia or a leukemoid condition. *Am. J. M. Sc.*, 1944, 208: 490-494. Case report. "The evidence as to the infectious or neoplastic nature of acute myelogenous leukemia is discussed. Evidence and opinions are cited holding trauma to be a possible etiologic factor in acute leukemia." 18 references.
123. Wolff, W. A., and Lee, W. E. A simple method for estimating plasma protein deficit after severe burns. *Ann. Surg.*, 1942, 115: 1125-1130. "A simple chart showing the relationship of plasma loss and hemoconcentration in severe burns has been constructed from the authors' equation. The plasma protein deficit in burned patients may be read from this chart when the hematocrit, plasma protein level and body weight are known. Under certain conditions accurately determined hemoglobin levels may be substituted for the hematocrit value." 10 references.
124. Wood, G. O. Lymph in experimental burns. *Arch. Surg.*, 1940, 41: 1038-1042. "Lymph collected from the thoracic ducts of burned animals has been tested for vasodepressor activity by intra-arterial injection into albino rats. No vasodepressor activity was demonstrated by this method of study." 14 references.
125. Zamecnik, P. C., Stephenson, M. L., and Cope, O. Peptidase activity of lymph and serum after burns. *J. Biol. Chem.*, 1945, 158: 135-144. Abstracted in: *Biol. Abstr.*, Balt., 1945, 19: No. 12361. "The presence of at least one peptidase, designated tentatively as an aminooxopeptidase, has been found consistently in normal lymph obtained from the legs of anesthetized dogs. An enzyme with similar

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properties has been found in serum and has been extracted from dog muscle, skin and subcutaneous tissue, and erythrocytes. Following a burn or trauma to a dog's extremity, this enzymatic activity rises abruptly in the lymph draining the affected area. In the calf and rat an increase in this enzymatic activity in serum has consistently been found following a burn. In bleb fluid collected from human burns, an enzyme with similar characteristics has been found." 15 references.

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126. Owens, N. Osteoporosis following burns. Brit. J. Plastic Surg., 1948, 1: 245-256. "Sudeck's osteoporosis has been reported as occurring following first-degree and second-degree burns. In burns with loss of skin, osteoporosis (diffuse and patchy in appearance) is a frequent manifestation that may be of more than academic interest inasmuch as it is a factor both in the degree of recovery to be ultimately obtained and a predisposing condition to fracture and osteomyelitis." 24 references.
127. Robert, P. Perichondritis der rechten Ohrmuschel nach Verbrennung II.-III. Grades des Gesichtes und der Ohren. Dermatologica, Basel, 1950, 101: 269. Case report.
128. Telkkä, A. Über den Einfluss der Verbrennung auf die fetale Knochenmasse. Ann. med. exp. biol., Fenniae, 1949, 27: 215-226. 12 references.

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129. Abell, R. G., and Page, I. H. A study of the smaller blood vessels in burned dogs and cats. Surg. Gyn. Obst., 1943, 77: 348-353. "Burns in dogs and cats produce vasoconstriction of the larger and smaller arteries and larger veins, which combined with constriction of arteriovenous anastomoses and packing of erythrocytes, results in reduced blood flow to the tissues and inadequate return of blood to the heart." 7 references.
- Baker, J. W., Wight, A., Michel, A. J. D., and Cope, O., see No. 10.
130. Barac, G. Sur le débit de la jugulaire externe du chien brûlé. C. rend. Soc. biol., 1946, 140: 1127-1128. Skin burns cause a constant decline of the output of the external jugular vein in the narcotized dog receiving physiological solution intravenously. Paper read at the meeting of the Société Belge de Biologie, March 1946.
131. *Basset, A., Ducoux, F., and Martineau, H. Présence d'une substance cardio-dépressive dans des extraits de muscles brûlés de grenouille. C. rend. Soc. biol., 1950, 144: 1048-1049. Abstracted in: Bull. Anal. CNRS, 1951, 12: pt. 2, 484. "Cauterization of a muscle produces one or several substances which have a strong depressor effect on all characteristic properties of the myocardium." (Bull. Anal. CNRS).

CARDIOVASCULAR SYSTEM (Continued)

132. Bonnal, J., and Pedinielli, L. R. Thrombose artérielle isolée chez un brûlé grave. *Marseille méd.*, 1949, 1: 382-386. Case report. Paper read at the meeting of the Société de Chirurgie de Marseille, November 1948.
133. Brooks, F. H., Dragstedt, L. R., Warner, L., and Knisely, M. H. The sequence of circulatory changes following severe thermal burns. *Anat. Rec.*, 1948, 100: 644. Experiments with dogs and rabbits showed that "blood cells passing through or near burned tissues agglutinated into relatively small, hard masses. Sludged blood thus poured into venous system until all circulating blood was agglutinated. The hard masses resisted passage through all peripheral vascular beds. The flow then slowed causing endothelial anoxia of the stagnant type, post-capillary venules began to leak (progressive hemoconcentration of circulating blood now occurred), vessels then plugged and only after vast numbers of small vessels were firmly plugged did an animal finally die." Abstract of a paper presented at the 61st Annual Session of the American Association of Anatomists, April 1948.
134. Brooks, F., Dragstedt, L. R., Warner, L., and Knisely, M. H. Sludged blood following severe thermal burns. *Arch. Surg.*, 1950, 61: 387-418. Abstracted in: *Chem. Abstr.*, 1950, 44: 10893d; *Bull. Anal. CNRS*, 1951, 12: pt. 2, 1240. "There is no evidence to support the theory that histamine is the 'toxin' of burn shock. The evidence does not rule out the possibility that some toxin exists, but strongly indicates that the toxic effect may be due to phy. changes. The extravascular (diapedesis and hemorrhage), intravascular (in thrombi), and phagocytic loss of red cells from the circulating blood, which accompanies the sludging changes following burn, may be important factors in post burn anemia." (*Chem. Abstr.*). 44 references.
135. Chisholm, T. C., and Hardenbergh, E. Some effects of experimental thermal burns on vascular endothelium employing a perfusion technic in anesthetized dogs. *Ann. Surg.*, 1948, 127: 75-89. "The results of employing [a new perfusion] technic for the study of the effects of heat on the permeability of the vascular endothelium and neighboring structures locally are described and discussed. In addition, observations on the systemic effects of such burns on the animal generally are reported." 12 references.
136. Cope, O., and Moore, F. D. A study of capillary permeability in experimental burns and burn shock using radioactive dyes in blood and lymph. *J. Clin. Invest.*, 1944, 23: 241-257. Abstracted in: *Biol. Abstr.*, 1944, 18: No. 18802. Dog experiments. "Following a hot water burn of a leg, the concentration of radioactive colloids in the lymph from this leg rises abruptly and approaches that encountered after injection of the inorganic ion. This indicates that in a pathologic state the capillary membrane may become as permeable to colloids as it formerly was only to ions." 21 references.

CARDIOVASCULAR SYSTEM (Continued)

137. Cordier, D., and Dessaux, G. Modifications du taux du glycogène cardiaque consécutives aux brûlures cutanées et à l'intoxication histaminique chez le rat. C. rend. Soc. biol., 1951, 145: 397-399. Abstracted in: Bull. Anal. CNRS, 1951, 12: pt. 2, 2481. In the burned rat the cardiac glycogen contents remain normal or increase. The average value is higher than that observed in traumatic shock; but the myocardium seems to be even less capable of using the glycogen reserve than the myocardium of the animal in shock.
- Courtice, F. C., see No.36.
138. Dragstedt, L. R., Brooks, F., Knisely, M. H., and Warner, L. Physical alterations of circulation blood following burn. Proc. Am. Fed. Clin. Res., 1945-47, 2: 108-109. Also in: Rocky Mountain M. J., 1947, 44: 40. "So far as we know, this is the first published account of direct observation of circulating blood following burn [by] two techniques: ... (1) the fused quartz rod method of Knisely; (2) observation through a binocular stereoscopic dissecting microscope of the small vessels of the bulbar conjunctivae obliquely illuminated by a Shahan ophthalmoscopic lamp. Studies were made on 18 albino rabbits and 12 dogs. ..." Abstract of a paper read at the meeting of the Western Section, American Federation for Clinical Research, December 1945.
139. Fibrinogen emboli from superficial burns. J. Am. M. Ass., 1943, 121: 596-597. A discussion of the paper by Kabat and Levine (No.144 of this list).
140. Fibrinogen emboli from superficial burns. Med. Soc. Rep., Scranton, 1943, 37: 11. A discussion of the work done by Kabat and Levine. (No.144 of this list).
141. Glenn, W. W. L., Gilbert, H. H., and Drinker, C. K. The treatment of burns by the closed-plaster method, with certain physiological considerations implicit in the success of this technique. J. Clin. Invest., 1943, 22: 609-625. "Experiments are reported in which the feet of dogs were burned for varying periods by immersion in hot water. They were then enclosed in plaster; ... the blood flow through the burned feet treated by these methods remained excellent and ... healing occurred more rapidly and with less deformity than could be obtained if capillary leakage was unrestrained. The physiological reasons for this success are analyzed." 15 references.
142. Gordenko, A. N. Izmenenie vozбудimosti vegetativnoi nervnoi sistemy i skorosti krovotoka pri ostrom ozhogovom shoke. [The changes of the excitability of the vegetative nervous system and the rate of blood circulation in acute burn shock.] Biull. eksp. biol. med., 1945, 19: 30-32. Dog experiments show that burn shock slows down circulation time and decreases the excitability and tonus of the sympathetic nervous system.

CARDIOVASCULAR SYSTEM (Continued)

143. Humblet, M., and Barac, G. Brûlure cutanée, infusion intraveineuse de liquide physiologique et données ophthalmoscopiques chez le chien. C. rend. Soc. biol., 1946, 140: 1210-1213. In the chloralosed animal, extensive burns are a negligible factor in the change of permeability of retinal vessels as demonstrated by the appearance of peripupillary edema. Intravenous physiological solution by itself can cause these alterations and, beyond a certain fluid quantity, retinal edema will occur very frequently, if not always. 7 references.
144. Kabat, H., and Levine, M. Capillary emboli as a lethal factor in burns. Science, 1942, 96: 476-477. Abstracted in: Biol. Abstr., Balt., 1943, 17: No. 13077. Experiments with cats point to "a distinct possibility that capillary emboli may play a role in the constitutional effects of severe burns." 7 references.
145. Kamen, G. F. Acrolein and shock; possible relationship of lipid breakdown products to shock associated with burns. Proc. Soc. Exp. Biol., N. Y., 1943, 52: 363-364. "Acrolein injected into experimental animals ... produces a (shock like) condition. ... It is believed that this picture is the direct result of capillary damage by acrolein or lipid breakdown products, rather than the result of the liberation of 'H' substance or other tissue breakdown protein substances."
146. Meyer, O. Phlebitis and burns. Indust. M., 1945, 14: 440-444. "All burns, except those of the first degree, are complicated by thrombosis of the small veins in the area of the burn. The application of pressure to the burned area prevents the spreading of the thrombophlebitis to the large, deep veins, prevents thrombi from detaching themselves from the walls of the veins, prevents the danger of septicemia, effects decongestion of the affected tissues by promoting the circulation, and removes pain." 5 references.
147. Monsaingeon, A. Phénomènes de diffusion dans les brûlures; modifications apportées par la cortisone. C. rend. Soc. biol., 1951, 145: 895-897. Abstracted in: Bull. Anal. CNRS, 1952, 13: pt. 2, 260. Injection of cortisone in 16 rabbits impeded or limited the increase of capillary permeability within the burn area, but not outside of it. 3 references.
148. Monsaingeon, A. Phénomènes de diffusion et facteurs d'anti-diffusion dans les brûlures. C. rend. Soc. biol., 1951, 145: 891-895. Abstracted in: Bull. Anal. CNRS, 1952, 13: pt. 2, 260. Experiments performed on 31 rabbits with blister serum, with vaccinal neuro-virus and with various dyes show increased capillary permeability during the first 48 hours following burns.
149. Moore, F. D. A note on the thrombophlebitis encountered. Ann. Surg., 1943, 117: 931-936. "... Patients who have been severely burned are prone, in a rather high percentage of cases, to develop thrombo-embolic phenomena from the veins of the legs."

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150. Netsky, M. G., and Leiter, S. S. Capillary permeability to horse proteins in burn-shock. *Am. J. Physiol.*, 1943/44, 140: 1-8. Abstracted in: *Am. J. M. Sc.*, 1943, 205: 753-754; *Biol. Abstr.*, Balt., 1944, 18: No. 2265. Intravenously injected serum appeared in the cervical lymph after 50-100 minutes in normal dogs and after 10-20 minutes in burned animals; in thoracic lymph, it appeared almost immediately after burns whereas it was normally found after 20 minutes. 18 references.
151. Newson, A. L., and Armstrong, K. B. A case of burns associated with bilateral retinitis. *Med. J. Australia*, 1945, 1: 459-460. "The damage was presumably caused by breakdown products of the initial tissue destruction, which affected the permeability of the capillaries supplied by the retinal vessels."
152. Olson, W. H., and Necheles, H. Experimental studies on burns. *J. Am. M. Ass.*, 1943, 122: 198. Experimentation on blood pressure following burns. Abstract of a paper presented at the Annual Meeting of the Central Society for Clinical Research, November 1942.
153. Olson, W. H., and Necheles, H. The vasopressor effect of thermal trauma. *Am. J. Physiol.*, 1943, 139: 574-582. Abstracted in: *Biol. Abstr.*, Balt., 1944, 18: No. 772. Experiments with dogs and cats showed a rise of blood pressure following burns. "Scalding of a denervated foot caused a slight drop in blood pressure; scalding of the normal foot resulted in a marked rise in blood pressure." Splenectomy, adrenalectomy, or splachnectomy were ineffectual while "hypophysectomized animals exhibited a marked fall." 18 references.
154. Page, I. H. Cardiovascular changes resulting from severe scalds. *Am. J. Physiol.*, 1944, 142: 366-378. Abstracted in: *Biol. Abstr.*, 1945, 19: No. 6233. "It is possible to divide the cardiovascular responses to scalding into three phases: 1, the burn phase, a short phase while burning is actually occurring, during which arterial pressure rises and all the phenomena associated with acute nervous excitation occur; 2, the transitional phase during which arterial pressure tends to fall slightly or moderately and response to some pressor drugs is enhanced; 3, the terminal phase during which the response begins to fail and may be abolished altogether. ... Not only the peripheral vascular bed becomes refractory, but the heart as well, as cardiometer studies have shown." 16 references.
155. Parsons, R., Jr., Alrich, E. M., and Lehman, E. P. Studies on burns. V. Experimental study of the effect of heparinization and gravity on tissue loss resulting from third degree burns. *Surg. Gyn. Obst.*, 1950, 90: 722-724. Abstracted in: *Bull. Anal. CNRS*, 1951, 12: pt. 2, 1242. Experiments on the burned rabbit's ear. "There is a delay of at least 4 hours after thermal injury before vascular occlusion occurs, provided the burn is not severe enough to cause immediate complete coagulation of the epithelium. Heparinization apparently delays the onset of dry gangrene and diminishes the amount of tissue loss." 5 references.

CARDIOVASCULAR SYSTEM (Continued)

156. Piccinini, P., and Bonaccorsi, R. La permeabilità capillare in alcune affezioni chirurgiche (traumatismi e ustioni) osservata mediante iniezione endovenosa di trypan-blau. Progr. med., Nap., 1946, 2: 457-459. Two cases only were studied; they presented abnormal capillary permeability believed to be the cause of hemoconcentration in burn patients. 7 references.

157. Prinzmetal, M., and Bergman, H. C. The nature of the circulatory changes in burn shock. Clin. Sc., Lond., 1944/45, 5: 205-227. Abstracted in: Chem. Abstr., 1947, 41: 4217h. This paper attempts to identify - by a series of eleven rat experiments - the nervous or humoral "factor in the production of burn shock not due to local fluid loss." I. The role of the nervous system. - II. Bleeding volume in burn shock. - III. Differences in haemo-concentration. - IV. Increased blood content of viscera in burned animals. - V. The importance of exsanguination. - VI. The capillary lesion. - VII. The vascular factor in the venous return. - VIII. Capillary atony, the primary disturbance. - IX. The humoral agent acts peripherally. - X. The toxic factor in extravasative shock. - XI. Demonstration of humoral factor. 24 references.

158. Prinzmetal, M., Bergman, H. C., and Kruger, H. E. Pathogenesis of burn shock. J. Clin. Invest., 1946, 25: 931-932. Capillary atony is stated to be "a primary disturbance because it occurs immediately following severe burns." The authors demonstrate by two methods their hypothesis that "a humoral factor [is] responsible for the capillary disturbance." Abstract of a paper read at the 38th Annual Meeting of the American Society for Clinical Investigation, May 1946.

159. Prinzmetal, M., Kruger, H. E., and Bergman, H. C. Effect of various lethal procedures and thermal injury on capillaries. J. Laborat. Clin. M., 1948, 33: 497-501. An investigation of the role of capillary hyperemia in shock due to fatal thermal trauma. 7 references.

160. Sarkisov, M. A. Bolevoi sindrom pri termicheskikh ozhogakh. [Pain syndrome in thermal burns.] Sovet. med., 1949, 6: 19-20. The effect of burn trauma and burn shock on capillary permeability and vasomotor control is discussed. The role of pain stimulation in burns is investigated and the theory is advanced that burn deaths generally are due to pain shock rather than to toxemia. This is demonstrated by the lowered mortality in 42 patients following novocain block.

161. Schwiegk, H., and Schöttler, W. H. A. Veränderungen der Capillarpermeabilität durch Hitzeeinwirkung. Klin. Wschr., 1947, 24/25: 360-362. Investigation of edema in the isolated burned rabbit's ear. 17 references.

162. Sevitt, S. The failure of anti-histamine drugs to influence the local vascular changes in experimental burns. Brit. J. Exp. Path., 1949, 30: 540-547. Abstracted in: Chem. Abstr., 1950, 44: 79866; Bull. Anal. CNRS, 1950, 11: pt.2, 2493. "The protection of guinea-pigs against the action

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of histamine by the drugs benadryl, antistlin or anthisan (neocantergan) had no detectable effect on experimental burns of various degrees of severity. The changes investigated included the erythema of burns, the capillary permeability and qualitative blood flow changes in the skin, the clinical degree of oedema formation, the skin sensibility and the subsequent clinical course of the burns." 15 references.

163. Sevitt, S. Local blood-flow changes in experimental burns. J. Path. Bact., Lond., 1949, 61: 427-442. Abstracted in: Bull. Anal. CNRS, 1950, 11: pt. 2, 1942. In guinea pigs, "continuation of the dermal blood flow in a burn was accompanied by normal skin sensation and by the absence of both clinical oedema and subsequent whole skin loss. The development of stasis was associated with clinical oedema and analgesia and followed by whole skin loss. A dermal threshold temperature is postulated at and above which the triad of stasis, analgesia and whole skin loss develops. Some of the implications of stasis in burns are discussed." 19 references.
164. Siedek, H., Wenger, R., and Zehetner, H. Kreislaufuntersuchungen nach schweren Verbrennungen. Wien. klin. Wschr., 1950, 62: 880-885. Abstracted in: Wien. med. Wschr., 1950, 100: 128. In 5 serious burn cases, blood pressure, pulse frequency, volume/minute, peripheral resistance, pulse wave velocity and hematocrit were recorded in detail. The analysis of the metabolic processes leads to the hypothesis that adenosine triphosphoric acid is mainly responsible for the observed "toxic" symptoms. Paper presented at the meeting of the Gesellschaft der Ärzte in Wien, December 1950. 25 references.

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165. Ashe, W. F., Jr., and Roberts, L. B. Experimental human burns; partial report. War Med., Chic., 1945, 7: 82-83. Hot blast method is described and time-temperature relationships are presented. 5 references.
166. Brooks, J. W., Robinett, P., Largen, T. L., and Evans, E. I. A standard contact burn; method of production and observations on the blood picture following its production in dogs. Surg. Gyn. Obst., 1951, 92: 543-554. "A 20 per cent body surface burn at 60 degrees C. for 1 minute has been produced and carefully studied and analyzed in 38 dogs. In this study, weight, temperature, hemoglobin, hematocrit, red blood cell count, white blood cell count, differential counts, total plasma protein, and blood volumes have been observed throughout the changes caused by the burn procedure." 19 references.
167. Evans, E. I. The burn problem in atomic warfare. J. Am. M. Ass., 1950, 143: 1143-1146. Includes discussion of the type of thermal injury resulting from flashburns. 19 references.

CLASSIFICATION AND STANDARDIZATION (Continued)

168. Gauthier, A., and Laugier, H. *Mathématiques puériles à propos de brûlures*. Rev. canad. biol., 1942, 1: 675-676. Burns of identical severity may be obtained by a 2:1 proportion of surface burned in the adult as compared to the child; by a 10:1 proportion in the tiger as compared to the cat. "Children are more sensitive to burns than adults."
169. Hazán, S. J., and Treadwell, C. R. Saline and methionine-saline effects on survival rate of rats receiving standardized burn shock. Proc. Soc. Exp. Biol., N. Y., 1948, 68: 684-686. Abstracted in: Bull. Anal. CNRS, 1950, 11: pt. 2, 459. "A simple and convenient method for producing standardized burn shock in rats is described. Isotonic saline injected intraperitoneally one hour before a standardized burn shock did not increase the survival rate; administration at the time of the burn or one hour following significantly increased the survival rate. Methionine-saline solution given one hour before burning significantly increased the survival rate; given at the time of the burn or one hour following, the effect was the same as with saline alone." 5 references.
170. Henriques, F. C., Jr. Studies of thermal injury. V. The predictability and the significance of thermally induced rate processes leading to irreversible epidermal injury. Arch. Path., Chic., 1947, 43: 489-502. "The experimental time-temperature relationships which determine the thresholds of epidermal injury (studies II [No. 523 of this list] and IV [No. 318 of this list] of 'Studies of Thermal Injury') are subjected to mathematical analyses. Two types of thermal exposure are considered: those in which the cutaneous surface is immediately brought to and maintained at a constant temperature, and those in which the skin is exposed to a constant source of circumambient and circum-radiant heat." 14 references.
171. Henriques, F. C., Jr. Studies of thermal injury. VIII. Automatic recording caloric applicator and skin-tissue and skin-surface thermocouples. Rev. Sc. Instrum., 1947, 18: 673-680. "An automatic recording caloric applicator is described and evaluated. This apparatus enables the skin surface to be brought immediately to and maintained at a constant, predetermined temperature. Further, it continuously records the rate of the perpendicular flow of heat through this skin site during the entire heat exposure."
172. Henriques, F. C., Jr., and Moritz, A. R. Studies of thermal injury. I. The conduction of heat to and through skin and the temperatures attained therein. A theoretical and an experimental investigation. Am. J. Path., 1947, 23: 531-549. Contents: I. Introduction. - II. Theoretical considerations; the nature of heat. - III. An experimental investigation of the quantities involved in both the steady and unsteady state of heat conduction through the skin. - IV. Estimation of the temperature changes at the epidermal-dermal interface during the exposure of the skin surface to heat. - V. Summary. 12 references.

CLASSIFICATION AND STANDARDIZATION (Continued)

173. Hoffman, J. M. Burns and scalds; their etiology and prognosis. *Am. J. Surg.*, 1942, 56: 463-468. "The prognosis of burns on a standard form of therapy depends partly on the etiologic factors involved. This is a prognostic factor which hitherto has been comparatively neglected in the literature of burns." 16 references.
174. Leach, E. H., Peters, R. A., and Rossiter, R. J. Experimental thermal burns, especially the moderate temperature burns: (A) Introduction and burning iron device, by R. A. Peters. (B) Macroscopic and microscopic damage at moderate temperatures, by E. H. Leach, R. A. Peters, and R. J. Rossiter. *Q. J. Exp. Physiol.*, Lond., 1943/44, 32: 67-86. Abstracted in: *Biol. Abstr.*, 1943, 17: No. 20459. Experiments with rats and guinea pigs. "With the object of producing standard low-temperature burns in animals, and of studying the area of tissue only partly damaged in a burn, a burning iron has been made capable of applying temperatures from 45°-80° C. to the skin; with this the amount of heat and temperature causing skin damage has been studied, and the macroscopic and microscopic damage due to graded temperatures have been delineated." 20 references.
175. Lehman, E. P. The delayed classification of burns. *Surgery*, 1942, 12: 651-653. Objections are raised to the "commonly accepted American classification of burns into three 'degrees'" and a new classification based on examination after sloughing is suggested.
176. Lidwell, O. M. Production of skin burns by hot gases. *Nature*, Lond., 1945, 156: 298-299. Abstracted in: *Biol. Abstr.*, 1946, 20: No. 3218. Calculated figures and experimental values are given for the "time taken to produce a burn of given severity." 2 references.
177. Lund, C. C., and Browder, N. C. The estimation of areas of burns. *Surg. Gyn. Obst.*, 1944, 79: 352-358. Table and diagrams are presented which "should be applicable, without serious error, to at least 99.5 per cent of all cases of burns." 12 references.
178. McCarthy, M. D. A standardized back burn procedure for the white rat suitable for the study of the effects of therapeutic and toxic agents on long-term survival. *J. Laborat. Clin. M.*, 1945, 30: 1027-1033. Abstracted in: *Biol. Abstr.*, Balt., 1946, 20: No. 19980. "A standard back burn procedure for the white rat (Wistar strain) is described. Survival rates are recorded for the following percentages of the total body surface burned: 20 per cent, 32 per cent, and 45 per cent (all ± 2). Environmental and bath temperature changes, humidity variations, seasonal change, variability in immersion time, animal variables including strain, weight, sex, and condition, and manipulations to which the animals may be subjected are all discussed in relation to their effect on survival." 3 references.

CLASSIFICATION AND STANDARDIZATION (Continued)

179. Morton, J. H., Kingsley, H. D., and Pearse, H. E. Studies on flash burns; threshold burns. Surg. Gyn. Obst., 1952, 94: 317-322. A method for producing flash burns in the pig is described. The burns were graded according to certain criteria. "Histological study demonstrated that burns showing only erythema at 24 hours had injury confined to the epidermis. In burns with surface coagulation or carbonization, injury was transepidermal." 11 references.
180. *Mostkovyi, M. I. K voprosu ob opredelenii poverkhnosti ozhoga. [On the problem of determining the area of a burn.] Vest khir. Grekova, Leningr., 1951, 71: 32-34.
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DEATH (Mechanism; Rates)

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On the question as to the mechanism of death caused by
burns. C. rend. Acad. sc. URSS, 1944, 42: 238-240.
10 references.
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mechanism of delayed death following thermal trauma.
J. Laborat. Clin. M., 1948, 33: 506-510. Abstracted in:
Biol. Abstr., 1948, 22: No. 20813. Experiments with
rats and mice. 6 references.
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of twenty-three deaths in 744 burned patients. Am. J.
Surg., 1946, 71: 26-35. 5 references.
189. Bull, J. P., and Squire, J. R. A study of mortality in a
burns unit. Ann. Surg., 1949, 130: 160-173. "The mor-
tality findings among 794 burned patients treated in hos-
pital by a Burns Unit are reported. The importance of
the age of the patient and the extent of the body surface
area burned in determining mortality is demonstrated.
The analysis of these findings by the Probit technic is
explained, and the results of this analysis for separate
age groups are given. The results by age-groups are
graphically correlated to show the expected mortality for
any given age and area. A grid table is provided for
making a simple comparative assessment of the results
obtained in other series." 12 references.
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679-687. Two cases are made the starting point for a
discussion of the mechanism of rapid death following
burns. 10 references.
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Methods, mortality and hemoconcentration curves. War
Med., Chic., 1943, 3: 477-481. "The effects of graded
and controlled thermal stimuli were studied on deeply
anesthetized dogs. The resultant injuries were followed
by a uniform mortality and survival period and by charac-
teristic hemoconcentration curves." 2 references.
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toxique. Usp. sovrem. biol., 1948, 25: 298-301. (In
Russian). Abstracted in: Bull. Anal. CNRS, 1949, 10:
No. 2, 688.
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peut-elle être considérée comme périmée? Beitr. klin.
Chir., 1950, 180: 493-496. Abstracted in: Bull. Anal.
CNRS, 1951, 12: pt. 2, 1241. "Modern research confirms
the classical pathogenesis of death following burns. The
good results obtained by use of antibiotics cannot be
considered an argument against this hypothesis because
they diminish only the rate of secondary mortality due
to infection." (Bull. Anal. CNRS).

DEATH (Continued)

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ENDOCRINE SYSTEM

200. Adams, F. H., Berglund, E., Balkin, S. G., and Chisholm, T. Pituitary adrenocorticotrophic hormone in severely burned children. *J. Am. M. Ass.*, 1951, 146: 31-33. Report of 3 cases. "Administration of pituitary adrenocorticotrophic hormone (ACTH) to severely burned patients is a rational form of treatment, justifying further investigation." 8 references.

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201. Bader, R. A., Stein, H. J., Eliot, J. W., and Bass, D. E. Hormonal alterations in men exposed to heat and cold stress. *Am. J. Physiol.*, 1948, 155: 425. Abstracted in: *Bull. Anal. CNRS*, 1949, 10: pt. 2, 2855-2856. "Hormonal alterations were measured in three men who were subjected to heat and cold stress utilizing intermittent exposures to heat (107°F. dry bulb; 89°F. wet bulb) and to cold (-200°F.) as stress stimuli." Abstract of a paper read at the Fall Meeting of the American Physiological Society, September 1948.
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203. Barac, G. Recherches sur la brûlure; hypophyse et diurèse aqueuse chez le chien brûlé. *Arch. internat. physiol.*, Liège, 1951, 58: 465-466. Abstracted in: *Bull. Anal. CNRS*, 1951, 12: pt. 2, 2481. Hypophysectomy does not affect the anti-diuretic effect of burns in dogs. This does not disprove that there might be a discharge of pituitrine in the non-hypophysectomized dog at the time of the burn. 5 references.
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205. Braasch, J. W., and Wakerlin, G. E. Effect of testosterone on the total urinary nitrogen excretion of the rat following burns. *Am. J. Physiol.*, 1948, 155: 428. Abstract of a paper read at the meeting of the American Physiological Society, September 1948.
206. Braasch, J. W., Wakerlin, G. E., Bell, J. H., and Levenson, S. M. The effect of testosterone propionate on the total urinary nitrogen excretion of the rat following burns. Chicago, 1949. (U. S. Army, Medical Nutrition Laboratory, Report No. 63). 40 p. Abstracted in: *Proc. Soc. Exp. Biol.*, N. Y., 1950, 75: 183-189; *Bull. Anal. CNRS*, 1951, 12: pt. 2, 1240. "The subcutaneous administration of testosterone propionate depressed the rise in urinary nitrogen excretion following burns in male and female rats. The effect of testosterone propionate in reducing the total urinary nitrogen excretion of male and female adult rats is essentially unchanged by a thermal burn for a period of eight days after the burn or onset of the testosterone medication. For two to four days after this period the effect of the drug post-burn is no longer evident. In normal female animals the effectiveness of testosterone propionate continues for at least 18 days whereas in normal males it disappears at 12 to 14 days." 47 references.

ENDOCRINE SYSTEM (Continued)

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211. Des Marais, A., and Dugal, L. P. Variations de l'acide ascorbique en fonction du poids des surrénales après les brûlures. Rev. canad. biol., 1949, 8: 315. Experiments with rats. The concentration of ascorbic acid in the adrenals decreases while, at the same time, the total ascorbic acid contained therein increases. The weight of the adrenal increases to a greater extent in hepatectomized animals than in sham-operated ones.
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213. Dugal, L. P., and DesMarais, A. Hépatectomie partielle et résistance aux brûlures. V. Variations de l'acide ascorbique et du poids des surrénales. Canad. J. Res., Sect. E., 1949, 27: 59-62. Abstracted in: Chem. Abstr., 1949, 43: 9224n; Bull. Anal. CNRS, 1950, 11: pt. 2, 193. "The changes in adrenal ascorbic acid and weight have been

ENDOCRINE SYSTEM (Continued)

studied in four groups of animals: (1) partially (65%) hepatectomized rats, (2) partially hepatectomized ones, burned six hours after operation, (3) sham operated controls, and (4) sham operated controls burned six hours after operation. Results show slight but significant differences in ascorbic acid concentration and adrenal weight between Group 2, in which the mortality is higher, and the other groups: ascorbic acid concentration is a little lower in the first 24 hr. after burns, and adrenal weight becomes higher only 48 hr. after burning." 9 references.

214. Gribble, M. de G., and Peters, R. A. The influence of thyroidectomy on post-burn N loss in rats. Q. J. Exp. Physiol., Lond., 1951, 36: 119-126. "... Post-burn N loss was less in thyroidectomized rats than in controls." 25 references.
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Kay, J. H., and Delancey, H., see No. 69.

ENDOCRINE SYSTEM (Continued)

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 221. *Kirschbaum, S. M. Cortisona en los quemados crónicos graves. Día méd., B. Air., 1951, 23: 3989-3999.
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 223. Levenson, S. M., Tagnon, H. J., Goodpastor, W. L., Green, R. W., Taylor, F. H. L., and Lund, C. C. Addison's disease associated with amyloidosis following thermal burns. N. England J. M., 1947, 237: 152-156. Case report. 9 references.
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- Monsaingeon, A., see No. 147.
- Monsaingeon, A., and Hurlé, A., see No. 78.
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ENDOCRINE SYSTEM (Continued)

229. Stein, H. J., Bader, R. A., Eliot, J. W., and Bass, D. E. Hormonal alterations in men exposed to heat and cold stress. *J. Clin. Endocr.*, 1949, 9: 529-547. Abstracted in: *Bull. Anal. CNRS*, 1950, 11: pt. 2, 645. "Three healthy males were exposed successively after a preliminary two-week period of physical conditioning to 19 five and one-quarter hour periods of heat (107°F. dry bulb, 89°F. wet bulb); to 14 five-hour periods of cold (--20°F.); to 5 re-exposures to heat; to a five-week interval of no exposure to environmental stress of rigorous exercise; and finally to 3 re-exposures to heat. Measurements of circulating eosinophils, absolute number of lymphocytes, urinary uric acid-creatinine ration, 24-hour 17-keto-steroid excretion and administration of ACTH were used to evaluate adrenal cortical responses." 51 references.
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233. Whitelaw, M. J. Physiological reaction to pituitary adrenocorticotrophic hormone (ACTH) in severe burns. *J. Am. M. Ass.*, 1951, 145: 85-88. Case report. "... Circulating endogenous adrenocorticotrophic hormone is quantitatively insufficient to meet the acute stress of severe burns. ... By administration of exogenous adrenocorticotrophic hormone the physiological phenomena usually present in severe burns are either eliminated or appreciably reduced." 13 references.
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ENDOCRINE SYSTEM (Continued)

235. You, S. S., You, R. W., and Sellers, E. A. Effect of thyroidectomy, adrenalectomy and burning on the urinary nitrogen excretion of the rat maintained in a cold environment. *Endocrinology*, 1950, 47: 156-161. "The thesis that a different mechanism is involved in the increased protein catabolism after burns and during exposure to cold has been discussed." 12 references.

GASTROINTESTINAL TRACT

236. Cordier, D., and Pérès, G. Troubles du transit gastrique et de l'absorption intestinale des solutions isotoniques de glucose à la suite des brûlures cutanées chez le rat. *C. rend. Soc. biol.*, 1951, 145: 399-401. Abstracted in: *Bull. Anal. CNRS*, 1951, 12: pt. 2, 2481. After burns, intestinal absorption of an isotonic glucose solution is retarded. Gastric evacuation is also considerably slower than in the intact animal. 5 references.
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239. Friesen, S. R. The genesis of gastroduodenal ulcer following burns; an experimental study. *Surgery*, 1950, 28: 123-158. "Investigation into the genesis of gastroduodenal ulcer following burns was carried out in 13 series of experiments utilizing 16 rabbits and 115 dogs, 80 of which were subjected to extensive burns by scalding. The etiological factors subjected to experimental evaluation included hemoconcentration in burns and allied conditions, thromboembolic phenomena (thrombosis and emboli, septic and fatty), toxin (histamine, gastric acidity, infection, sepsis, and products of tissue breakdown), shock, and the adrenal factor." 139 references.
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GASTROINTESTINAL TRACT (Continued)

241. Friesen, S. R., and Wangensteen, O. H. Role of hemoconcentration in production of gastric and duodenal ulcer following experimental burns. Proc. Soc. Exp. Biol., N. Y., 1947, 64: 81-85. Abstracted in: Biol. Abstr., Balt., 1947, 21: No. 16892. "...Increased concentration of the blood following burns is an important factor in the occurrence of gastro-duodenal ulcer after experimental burns. ... Gastro-intestinal abnormality following burns, even when accompanied by histamine administration, may be prevented by avoidance of the hemoconcentration of burns by proper therapy. The incidence of gastric and/or duodenal ulceration provoked by hemoconcentration in burns is markedly increased when histamine-in-beeswax administration accompanies the burn." 5 references.
- Hansen, G. A., see No. 215.
242. Hartman, F. W. Curling's ulcer in experimental burns. Ann. Surg., 1945, 121: 54-64. Animal experiments. 18 references.
243. Hartman, F. W. Curling's ulcer in experimental burns. II. The effect of penicillin therapy; correlation of observations with other recent evidence regarding pathogenesis of peptic ulcer. Gastroenterology, 1946, 6: 130-139. "Of 28 control dogs receiving third degree burns over 50 to 60 per cent of the shaved body surface, all animals examined showed positive blood cultures, and 77.7 per cent developed acute duodenal ulcers. ... Congestion and edema of the duodenal and gastric mucosa has been noted in many of these dogs with burns. ... This mucosal congestion constitutes the precursor or background for subsequent ulceration. ... Detailed pathological evidence has demonstrated that the final stage of duodenal and gastric ulceration in these dogs is a corrosive and not a local infectious process." 13 references.
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GASTROINTESTINAL TRACT (Continued)

to the combination of delayed shock and haemorrhage. ... and that the melena and haematemesis were due to duodenal ulceration caused by toxic products absorbed from the burnt areas.

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250. Mynhardt, M. R. Double duodenal ulcer with perforation following a burn. S. Afr. M. J., 1951, 25: 114-115. Case report, with general description of Curling's ulcer including histopathology. 3 references.
251. Necheles, H., Prescott, E., and Olson, W. H. The effect of atropine on the gastric secretion following thermal trauma. Surgery, 1946, 20: 382-384. Abstracted in: Chem. Abstr., 1948, 42: 74291; Biol. Abstr., Balt., 1947, 21: No. 13912. "Relatively large doses of atropine did not affect the increased gastric secretion of the dog's stomach following burns. Since gastric hypermotility of burns is suppressed completely by atropine, it is assumed that, in burns, two different mechanisms activate gastric secretion and gastric motility. Gastric motility of burns may be due to a cholinergic mechanism, and gastric secretion of burns may be due to a histaminic mechanism." 6 references.
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253. Prossinger, F. Nekrotisierende ulzeröse Ileitis terminalis und Ösophagitis nach Verbrennungen. Münch. med. Wschr., 1950, 92: 279-287. Report of two cases; discussion of the etiology and survey of the literature. 31 references.
254. Ramsey, T. L., and Mosquera, V. T. Perforating duodenal ulcer associated with burns. Ohio M. J., 1947, 43: 276-277. Case report. 7 references.
255. Rankin, L. M. Perforated ulcer of esophagus following a burn. Am. J. Surg., 1945, 67: 134-136. Case report. 9 references.
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- permeability and to fluid loss. p. 50-53. Blood changes and blood pressure in burned patients. (Methods. - Haemo-concentration and shock. - Anaemia in burns. - Changes in the leucocytes in burns.) p. 114-164. Alterations in urinary constituents. Alterations in blood constituents. Function tests. Post-mortem analysis of tissue. The absorption and excretion of sulphonamides. Correlation in time of changes in blood and urine. p. 166-191. Deaths occurring during the "shock period." Deaths occurring after the "shock period." p. 192-202.
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INFECTION AND BACTERIOLOGY (Continued)

356. Gordon, J., Hall, R. A., Heggie, R. M., and Horne, E. A. A histological and bacteriological study of healing burns with an enquiry into the significance of local infection. *J. Path. Bact., Lond.*, 1946, 58: 51-61. Abstracted in: *Biol. Abstr., Balt.*, 1946, 20: No. 13216. Detailed report of 10 cases. "In spite of the usual precautions in exposing burns for examination, all but two out of fifteen investigated showed the presence of haemolytic streptococci or *Staphylococcus aureus* at some stage, while in nine both organisms were present. Other associated bacteria included *Staph. albus*, diphtheroids, *B. proteus*, *Ps. pyocyanea*, *B. coli* and coarse Gram-negative diplococci. ... Great variations were observed in the character of the inflammatory response." 10 references.
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wounds under sulfonamide therapy. 4. Flora of partial-thickness burn wounds under penicillin therapy. 5. Distribution of flora according to body area. Part II. The development of resistance to penicillin by the flora of full-thickness burn wounds in patients treated with penicillin systemically. Part III. The incidence, virulence and resistance to penicillin of the staphylococcus in burn wounds of patients treated with penicillin or sulfonamides; the significance of staphylococcal immunity to the healing of the wounds infected with the staphylococcus. Part IV. The incidence, virulence and resistance to penicillin of the streptococcus in burn wounds of patients treated with penicillin or sulfonamides. 47 references.

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INFECTION AND BACTERIOLOGY (Continued)

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KIDNEYS

- Barac, G., see No. 202.
372. Barac, G. Brûlure cutanée et diurèse aqueuse chez le chien. *C. rend. Soc. biol.*, 1946, 140: 580-581. Abstracted in: *Excerpta med.*, Sect. 2, 1948, 1: 128. "Oliguria and acute anuria of the dog after burns are determined by excitation of the renal nerves. According to our present knowledge, this mechanism does not exclude the participation of other factors."
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- Barac, G., see No. 11.
- Barac, G., see No. 12.
374. Barac, G. Histamine, antihistaminiques et diurèse aqueuse chez le chien normal et chez le chien brûlé. *C. rend. Soc. biol.*, 1949, 143: 550-553. Abstracted in: *Chem. Abstr.*, 1950, 44: 3142-3143. "In dogs large skin burns caused a marked decrease in urine secretion. In normal intact dogs the injection of sufficient histamine to produce a blood level of about 15 γ /100 cc. caused a transient decrease in urine secretion. This action was independent of the hypotensive action and was not prevented by immediately previous injection of antihistaminics. The same antihistaminics had no effect on the oliguria from skin burns." (*Chem. Abstr.*).
- Barac, G., see No. 13.
- Barac, G., see No. 14.

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375. Barac, G. Recherches sur la brûlure; effet antidiurétique du sang de chien brûlé a l'égard des reins au cou. Arch. internat. physiol., Liège, 1948, 56: 172-176. Abstracted in: Bull. Anal. CNRS, 1950, 11: pt. 2, 1942. Cross-circulation experiments with dogs prove the immediate renal antidiuretic effect of blood perfusing from the burned animal. 1 reference.
- Barac, G., see No. 203.
- Barac, G., see No. 204.
376. Barac, G. Sur le mécanisme de l'oligurie du chien brûlé. Experientia, 1947, 3: 200-202. The decreased diuresis observed on continuously infused dogs following burns is due neither to hypoproteinemia nor to increased plasma viscosity nor to reduced plasma volume. It is likely that an antidiuretic substance is produced by the burn. 9 references.
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385. Martineau, P. C., and Hartman, F. W. The renal lesions in extensive cutaneous burns. *J. Am. M. Ass.*, 1947, 134: 429-436. Abstracted in: *Biol. Abstr.*, 1948, 22: No. 403. A study based on 84 experimentally burned dogs and 20 cases in man.
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388. Monsaingeon, A., and Tanret, P. Note sur les modifications de la circulation intra-rénale après brûlure. *C. rend. Soc. biol.*, 1949, 143: 1461-1463. Abstracted in: *Bull. Anal. CNRS*, 1950, II: pt. 2, 1182. Experiments with guinea pigs, rabbits and rats demonstrate the presence of intra-renal vasomotor disturbances as shown by the intrarenal distribution of intravascular dyes. These phenomena may explain the mechanism of diuretic disturbances following burns.
389. Monsaingeon, A., Tanret, P., and Daussy, M. La circulation intra-rénale des brûlés; étude expérimentale. *Presse méd.*, 1949, 57: 1221-1224. Abstracted in: *Bull. Anal. CNRS*, 1950, II: pt. 2, 705. Experiments demonstrate the possibility of an exclusion of cortico-renal circulation after burns. 15 references.
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KIDNEYS (Continued)

the effect of various agents on the anuria produced by severe burns." Abstract of a paper delivered at a meeting of the Chicago Society of Internal Medicine, April 1945.

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392. Olson, W. H., and Necheles, H. Studies of anuria; effect of infusion fluids and diuretics on the anuria resulting from severe burns. *Surg. Gyn. Obst.*, 1947, 84: 283-291. Abstracted in: *Chem. Abstr.*, 1947, 41: 7526f; *Biol. Abstr.*, Balt., 1947, 21: No. 24657. Translated in: *Dia méd.*, B. Air., 1947, 19: 445-452. Report on 68 dog experiments. 22 references.
393. Picard, J. Influence des acides aminés soufrés sur l'excrétion azotée urinaire des rats brûlés. *Bull. Soc. chim. biol.*, Par., 1950, 32: 672-679. During several days following a burn, the urinary nitrogen excretion (particularly of non-uric nitrogen) is increased. Methionine and cystine do not reduce this nitrogen deficit. 13 references.
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395. Tagnon, H. J., Levenson, S. M., Goodpastor, W. E., and Taylor, F. H. L. A clinico-pathologic correlation of the kidney in patients with thermal burns. *Proc. Am. Fed. Clin. Res.*, 1945, 2: 24-25. Of 485 "patients with thermal burns admitted to the Boston City Hospital," 4 died after more than 2 weeks and presented no renal changes, whereas in a group of 35 dying within 2 weeks, 14 cases of kidney abnormalities were found. They "were principally the presence of tubular casts and tubular degeneration or necrosis." Abstract of a paper presented at the Meeting of the Midwestern Section of the American Federation for Clinical Research, November 1944.

LEGAL ASPECTS

Beck, W. V., see No. 16.

396. Brown, T. C., Delaney, R. J., and Robinson, W. L. Medical identification in the "Noronic" disaster. *J. Am. M. Ass.*, 1952, 148: 621-627. The identification of all but 3 of 119 persons burned to death in the Noronic disaster was an

LEGAL ASPECTS (Continued)

- "outstanding achievement" of modern pathology: "The facial features were wiped out, the skin was burned away, many limbs were missing, the viscera were shrivelled, and the clothing frazzled. So severely damaged were the bodies that few distinguishing characteristics remained, and the difficulties to be resolved far exceeded the capacity of the accepted procedures in the science of identification." 9 references.
397. Dérobert, and Gascoin. Chute en gant des téguments de la main après brûlure. Ann. méd. lég., 1950, 30: 255-259. A case of unusually rapid sloughing-off of the teguments of the hand.
398. Dutra, F. R. Medicolegal examination of bodies recovered from burned buildings. Am. J. Clin. Path., 1949, 19: 599-607. 8 references.
399. Giuliani, G. Suicidio per ustioni, da introduzione in un forno. Lav. Ist. anat. istol. pat. Univ. Perugia, 1945, 4: 199-207. Case report.
400. Lacroix, G. Considerazioni medico-legali su di una morte per ustione. Rass. med. indust., 1942, 13: 159-165. The author presents a short discussion of the mechanism of death following burns and describes the possibility of myocardial changes in burn patients. On the basis of macroscopic and microscopic examination of an accident victim, he stresses the medico-legal importance of cardio-pulmonary complications. 17 references.
401. Piédelièvre, Dérobert, Balthazard, and Piédelièvre. Morphologie des brûlures par gouttes d'huile projetées. Presse méd., 1943, 51: 392-393. The morphology of recent burns and old burn scars is important in determining the direction of the spray. Abstract of a paper read at a Meeting of the Société de Médecine Légale de France, April 1943.
- Ponsold, A., see No. 90.
402. Sampson, B. F. Intracranial haemorrhages after death by burning. Clin. Proc., Cape Town, 1946, 5: 189-194. No definite answer is given to the question if heat alone can "cause intracranial haemorrhage in a person who is alive at the time of being placed in a fire."
403. Tesař, J. Popálení. [Burns.] Voj. zdrav. listy, 1949, 18: 278-283. "The author in this paper outlines the morbid anatomic and morbid physiologic changes of forensic significance caused through burning. The local and systemic changes are described, particularly those caused in the blood, lungs, liver, kidneys, suprarenals and stomach. Death may be caused by a primary or secondary shock, through toxemia or by infection. A method of evaluation of the burned surface is given and the question of suicide, murder and accidental burning is discussed." Russian, English and French summaries.

LIVER

404. Baker, R. D. The internal lesions in burns with special reference to the liver and to splenic nodules. *Am. J. Path.*, 1945, 21: 717-739. Abstracted in: *Biol. Abstr.*, Balt., 1945, 19: No. 21240. 26 references.
405. Belt, T. H. Liver necrosis following burns, simulating the lesions of yellow fever. *J. Path. Bact.*, Lond., 1939, 48: 493-493. "Four cases of extensive superficial burns in which death occurred within four days presented severe liver damage with mid-zonal necrosis, Councilman lesions and intranuclear inclusion bodies. These findings were practically indistinguishable from those occurring in yellow fever." 18 references.
406. Boyce, F. P. The hepatic (hepatorenal) factor in burns. *Arch. Surg.*, 1942, 44: 799-818. "Although the universal application of the theory of hemoconcentration in burns is granted, it is pointed out that considerable valid evidence also exists in favor of the toxemic theory, and it is suggested that the two theories are not mutually exclusive. The hepatic factor in the nonbacterial toxemia of burns is discussed from the experimental, clinical, laboratory and pathologic (postmortem) aspects." 46 references.
407. Buis, L. J., and Hartman, F. W. Histopathology of the liver following superficial burns. *Am. J. Clin. Path.*, 1941, 11: 275-287. "Extensive central necrosis of the liver is regularly seen in burn cases dying three to five days after the injury. Similar liver necrosis has been produced in our experimental animals and the lesion parallels the extent and severity of the injury. ... Anoxia resulting from the shock, plasma loss, hemoconcentration and acute congestion is suggested as a contributing cause of the liver necrosis." 12 references.
408. Clark, E. J., and Rossiter, R. J. Metabolism of liver slices after burning. *Q. J. Exp. Physiol.*, Lond., 1943/44, 32: 269-277. Abstracted in: *Biol. Abstr.*, 1944, 18: No. 15668. Changes observed in experiments with rabbit liver slices are "in all probability secondary to the circulatory changes following the burn." 41 references.
409. DesMarais, A., and Dugal, L. P. Hépatectomie partielle et résistance aux brûlures. I. Variations de la glycémie au cours des 24 premières heures. *Rev. canad. biol.*, 1947, 6: 368-371. Abstracted in: *Excerpta med.*, Sect. 3, 1948, 2: 443. "... Blood sugar variations after burns are parallel in hepatectomized and control animals. The blood-sugar level is lower in hepatectomized rats, but hypoglycaemia is recorded in only a few of the experiments, even in those in which death occurs." (*Excerpta med.*).
410. DesMarais, A., and Dugal, L. P. Hépatectomie partielle et résistance aux brûlures. II. Variations de l'azote aminé du sang total. *Rev. canad. biol.*, 1948, 7: 207-211. Abstracted in: *Chem. Abstr.*, 1948, 42: 59771. "The level of whole blood a-amino nitrogen is increased after

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burns in the control as well as in the partially hepatectomized animals [rats]. The absolute increase is more pronounced in the hepatectomized animals than in the controls. ... There is no relation between the absolute level of a-amino nitrogen and resistance to burns of control animals as compared to partially hepatectomized ones." 8 references.

411. DesMarais, A., and Dugal, L. P. Hépatéctomie partielle et résistance aux brûlures. III. Influence du jeûne sur la survie. Rev. canad. biol., 1949, 8: 240-242. Abstracted in: Bull. Anal. CNRS, 1950, 11: pt. 2, 2492-2493. "White rats of equivalent weights have been divided into two groups: 1) hepatectomized animals (removal of 65% of the liver); 2) hepatectomized animals fasting for 48 hours (24 hours before and after hepatectomy). All animals have been submitted to standard burns six hours after hepatectomy. Results show that the survival is the same in both groups, i.e. is not influenced by fasting." 6 references.

412. DesMarais, A., and Dugal, L. P. Hépatéctomie partielle et résistance aux brûlures. IV. Variation de la glycémie au cours des cinq jours suivant les brûlures. Rev. canad. biol., 1949, 8: 243-247. "The changes in blood sugar were followed for a five days period in three groups of rats: rats burned after partial hepatectomy, burned sham operated controls, and non burned partially hepatectomized controls. The results indicate a complete lack of correlation between glycemia and resistance to burns after partial hepatectomy." 12 references.

Dexter, F. E., and Petersen, R. E., see No. 212.

413. Duffin, J. D. Liver necrosis following burns. Canad. M. Ass. J., 1942, 47: 138-139. "A case is reported in which jaundice and signs of severe liver damage developed following burns. Advanced liver necrosis was found. The lesions were indistinguishable from these encountered in the livers of previously reported cases of burns and of yellow fever, and closely resembled those described as being present in Rift Valley fever." 7 references.

Dugal, L. P., and DesMarais, A., see No. 213.

414. Dugal, L. P., and Desmarais, A. Influence des brûlures sur la régénération et le taux de matières sèches du foie après hépatéctomie partielle. Rev. canad. biol., 1948, 7: 212-216. Abstracted in: Chem. Abstr., 1948, 42: 5978a. Rat experiments. "Five days after partial hepatectomy, the regeneration of the liver is so high (85%) that ... the hepatectomy (65%) has lost its value as a test for the activity of the liver. ... During regeneration of the liver, there is a definite increase of the water content in this organ. Burning, with or without starvation, has no effect neither on the regeneration nor on the water content of the liver, as determined in the well defined conditions of our experiments." 4 references.

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415. Dugal, L. P., DesMarais, A., Desaulniers, L., and Rinfret, M. Hépatectomie partielle et résistance aux brûlures. *Rev. canad. biol.*, 1944, 3: 474-480. "All the controls (37) have survived whereas 60% (25 out of 42) of the partially hepatectomized animals have died after having been burnt with exactly the same intensity. 90% of the experimental animals did urinate blood, whereas less than 5% of the controls showed the same phenomenon." 10 references.
416. Gillman, J., and Gillman, T. Structure of the liver in fatal burns. *S. Afr. J. M. Sc.*, 1948, 13: 169-181. Abstracted in: *Chem. Abstr.*, 1949, 43: 4760c. "An examination of the livers of 38 cases dying from burns within 1 hour and up to 36 days after the accident, disclosed three main types of reactions, namely, loss of stainability of the liver cells, fatty changes and atrophy of cells in the central zone of the lobule. ... From an analysis of the relevant data it was concluded, firstly, that in the majority of fatal cases of burns, the morphological changes in the liver were insufficient to account for death, and, secondly, if the liver does contribute to death it does so at the chemical level." 17 references.
- James, G. W., III, Purnell, O. J., and Evans, E. I., see No. 68.
417. Kasaka, K. Kasyo nyuin kanza no Zambrini-Watanabe hanno ni tuite. [The Zambrini-Watanabe test in burn victims.] *Sikagaku zasshi*, 1947, 4: 45-50. Results vary greatly. In case of liver damage, lower pH is found. Patient should then be observed until pH rises to 10-12. Conclusions should never be based on 1 or 2 determinations, but on systematic observation. 9 cases. 11 references.
- Képinov, L. I., see No. 220.
418. McClure, R. D. Liver injury in burns. In: Josiah Macy Jr. Foundation, 2nd Conference on Liver Injury, N. Y., 1944. p. 87-89. Extensive liver damage is ascribed to the use of tannic acid rather than to thermal trauma.
419. Rae, S. L., and Wilkinson, A. W. Liver function after burns in childhood. *Lancet*, Lond., 1944, 1: 332-334. "Liver function has been tested after the treatment of burns with silver nitrate, with a tannic acid jelly, and with sulphacetamide. Disturbance of liver function was greatest with tannic acid and least with silver nitrate." 12 references.
420. Saltonstall, H., Walker, J., Jr., Rhoads, J. E., and Lee, W. E. The influence of local treatment of burns on liver function. *Ann. Surg.*, 1945, 121: 291-300. Abstracted in: *Biol. Abstr.*, Balt., 1945, 19: No. 21462. "It ... seems unlikely that the increase in liver damage observed when tannic acid is used is of great significance in the mortality among burn patients. It would seem fair to conclude, therefore, that hepatic damage is probably not the primary cause of death in burn toxemia." 23 references.

MUSCLES

421. Antos, R. J., Dworkin, R. M., and Green, H. D. Shock associated with deep muscle burns. Proc. Soc. Exp. Biol., N. Y., 1944, 57: 11-13. Abstracted in: Biol. Abstr., Balt., 1945, 19: No. 4396. "The accumulation of fluid at the site of the burn is the principal factor responsible for the prodromal stage of shock in the burned dogs. Association of the extensive muscle destruction with restriction of movement and with prolonged moderately deep anesthesia converts the prodromal stage into outspoken shock with death of the dog even when the accumulation of fluid at the site of the burn is quite small." 2 references.

Ely, J. O., see No. 45.

422. Ely, J. O. Experimental burns; changes in the phosphorus content and moisture content of muscle. J. Franklin Inst., 1947, 235: 416-424. Abstracted in: Biol. Abstr., Balt., 1944, 18: No. 4516. Rat experiments. "... beginning 15 minutes after inflicting the burns and extending for the maximum experimental period used (14 days), the total phosphorus, the acid soluble inorganic, acid soluble organic and acid insoluble phosphorus content of the burn-injured muscle was lower than that in the uninjured muscle. The phosphorus content was found to be lowest in the burn-injured tissue during the period of 1 to 24 hours after inflicting the burn. ..."

423. *Jessen, K. E., Andersen, J. E., and Perdrup, A. Examens suivis des brûlures de la main. Acta chir. scand., 1950, 100: 155-160. Abstracted in: Bull. Anal. CNRS, 1951, 12: pt. 2, 2481. "Examination of 113 burn patients 5-7 years after the accident. Sequelae in 50% of 3rd degree burns, with 5% present permanent functional disabilities." (Bull. Anal. CNRS).

424. McIndoe, A. H. The burned hand. In: Modern Treatment Yearbook, 1945: 221-231. See particularly: Causes and varieties. - Effect of generalised heat on the hands. - Edema. - Tendon involvement. - Involvement of joints. - Terminal necrosis. 13 references.

NERVOUS SYSTEM

Barac, G., see No. 11.

Barac, G., see No. 13.

Barac, G., see No. 14.

Barac, G., see No. 377.

425. Bender, L. Burn encephalopathies in children. Arch. Pediat., N. Y., 1943, 60: 75-87. Case reports. 11 references.

NERVOUS SYSTEM (Continued)

426. Bender, L. Neuropsychiatric problems in burn encephalopathies of childhood. *J. Nerv. Ment. Dis.*, 1942, 96: 205-206. Also in: *Arch. Neur. Psychiat.*, Chic., 1942, 48: 676-677. Abstract of a paper presented at the Meeting of the Boston Society of Psychiatry and Neurology, January 1942. Discussion by Dr. M. B. Bender and Dr. H. A. Riley. (For the full text of this paper, see No. 425 of this list.)
 427. Elman, R. The influence of ether, morphine and nembutal on mortality in experimental burns. *Ann. Surg.*, 1944, 120: 211-213. "Morphine increases the 24-hour mortality (up to 100 per cent) in severe experimental burns, particularly when given in large doses and with nembutal. Practically no 24-hour mortality occurred when ether alone was employed. It is inferred that large doses of morphine, when used in the absence of pain, may increase the early mortality in severe human burns." 3 references.
 428. Flügel, F. Polyneuritis nach Verbrennung. *Nervenarzt*, 1947, 18: 499-501. Report of 2 cases of polyneuritis and Guillain-Barré syndrome after burns; the hypothesis is propounded that these complications are allergic reactions. 6 references.
- Gordenko, A. N., see No. 142.
429. *Hasche-Klunder. Sur des lésions des nerfs périphériques & la suite de brûlures. *Beitr. klin. Chir.*, 1949, 178: 589-596. Abstracted in: *Bull. Anal. CNRS*, 1951, 12: pt. 2, 2171. "Two cases of nervous lesions of the leg due to resorption of toxic substances following burns." (*Bull. Anal. CNRS*).
 430. Hughes, L. Burns with cerebral complications. *Med. J. Australia*, 1947, 2: 122. Case report (male aged 21 months).
 431. Kabat, H., and Hedin, R. F. The nervous factor in burns. *Proc. Soc. Exp. Biol.*, N. Y., 1942, 49: 114-116. Experiments on the effect of thermal trauma in control cats and in spinal animals showed that an observed abrupt rise in blood pressure in control cats is "reflex and masks an initial sharp fall due to non-nervous factors," and that "elimination of the nervous factor decreases the rate and maximum extent of hemoconcentration following burns."
 432. Kabat, H., Hedin, R. F., and Wing, R. A nervous factor in the etiology of shock in burns. *Surgery*, 1942, 11: 766-776. "In control cats, thermal trauma results in an immediate rise in blood pressure which is sustained for many hours. In spinal animals, there is a temporary fall in blood pressure followed by a lesser rise as a result of the burn. Hemoconcentration following a burn is less in spinal animals. Spinal transection decreases local fluid loss in the area of the burn. The increase in respiratory rate resulting from the burn is greater in spinal animals." 14 references.

NERVOUS SYSTEM (Continued)

433. Parrot, J. L. Sur le mécanisme périphérique de la douleur. Intervention de l'histamine dans la brûlure et le prurit. *C. rend. Soc. biol.*, 1943, 137: 620-621. Intravenous injection of 10 mg/kg dimethyl-amino-ethyl-N-benzylaniline chloride delays the pain sensation of burning in man by an average of 16%. 2 references.
434. Perez, M. Il ruolo del sistema nervoso nell'insorgenza della sindrome generale immediata dopo scottature. *Policlinico*, 1949, 56: 1-9. On the basis of dog experiments, the author concludes that the general syndrome immediately following scalding is a nervous reflex phenomenon. 12 references.
- Rosin, Ia. A., and Gromakovskaia, M. M., see No. 95.
435. Roth, N. Encephalopathy due to burns. *Arch. Neur. Psychiat.*, Chic., 1941, 45: 980-983. "An unusual case of encephalopathy due to burns is here presented, in which there were aphasia, athetosis and mental deterioration. The damage to the central nervous system is related to changes in the blood and circulatory apparatus." 5 references.
436. Schachter. Les encéphalopathies infantiles consécutives à des brûlures. *Ann. paediat.*, Basel, 1947, 168: 105-112. "Report of two cases of encephalopathy after burns in which other pre-disposing factors could be recognised. Birth trauma of the brain, parental alcoholism and infection play a part. Only on the soil of a previously damaged nervous system can burns act as provoking factors." 5 references.
437. Schachter, M. Encéphalopathies et troubles caractériels à la suite des brûlures chez l'enfant. *Acta psychiat. neur.*, Kbh., 1950, 25: 285-292. Report of 4 cases. 6 references.
438. Schachter, M. Insomnie rebelle passagère, complication d'encéphalique de brûlure intense, localisée. *Méd. inf.*, Par., 1947, 54: 36-40. Case report. 2 references.
- Verdan, C., see No. 256.
- Verdan, C., see No. 257.
439. Walker, J., Jr., and Shenkin, H. Studies on the toxemia syndrome after burns. II. Central nervous system changes as a cause of death. *Ann. Surg.*, 1945, 121: 301-313. Spanish translation in: *An. chirurg.*, B. Air., 1945, 4: 306-318. "The case histories of six patients having severe burns and clinical evidence of central nervous system damage are presented. Five of these patients died in sudden respiratory failure when the renal and hepatic damage associated with burn toxemia was decreasing in severity. The sixth patient had two episodes of apnea during the toxic period but survived to die 62 days later of a pulmonary embolus. The brain in this case showed evidence of damage of the same type but of lesser degree than was seen in the other five patients." Gross and histological findings are reported. 14 references.

NITROGEN BALANCE

440. Beattie, J. Metabolic disturbances after injury. Brit. M. J., 1947, 2: 813-817. Abstracted in: Biol. Abstr., Balt., 1948, 22: No. 13423. Data on the negative nitrogen balance following burns of the lower limbs and of hands and arms are included. 27 references.
441. Berkkum, D. W. van, and Peters, R. A. Observations upon a change in an enzymatic process in burns. Q. J. Exp. Physiol., Lond., 1951, 36: 127-137. "A significant difference in the rate of deamination of DL-alanine by liver slices of rats has been found between unburned and burned animals at the height of the nitrogen loss in the urine. ... The experiments presented suggest this difference to be of an enzymatic nature. ... It appears to be the first enzymatic change to be correlated with the loss of N in the urine." 20 references.
442. Braasch, J. W., Bell, J. H., and Levenson, S. M. Excretion of nitrogen and electrolytes following thermal burns in the rat. Chicago, 1949. (U. S. Army, Medical Nutrition Laboratory, Report No. 57). 23 p. "Following the burn the urinary nitrogen excretion rose to a peak in three to four days and remained elevated for approximately 12 days. The excretion in the urine of potassium and phosphorus increased for one to two days after the burn but returned thereafter to the pre-burn level. These findings indicate that there is a dissociation of nitrogen and phosphorus and nitrogen and potassium excretions following thermal burns in the rat. Pentobarbital anesthesia had no effect on the urinary excretion of nitrogen, potassium, or phosphorus." 27 references.
443. Braasch, J. W., Bell, J. H., and Levenson, S. M. The excretion of nitrogen and electrolytes following thermal burns in the rat. Surgery, 1950, 27: 743-751. Abstracted in: Bull. Anal. CNRS, 1951, 12: pt. 2, 484. "The excretion of nitrogen, phosphorus, and potassium was studied in ten force-fed, male, young adult albino rats before and after thermal burns and pentobarbital anesthesia or only pentobarbital anesthesia." 28 references.
- Braasch, J. W., and Wakerlin, G. E., see No. 205.
- Braasch, J. W., Wakerlin, G. E., Bell, J. H., and Levenson, S. M., see No. 206.
444. Chanutin, A., and Ludewig, S. Effects of proteins and methionine on nitrogen balance of burned rats. Surgery, 1947, 21: 593-596. "The intake and excretion of nitrogen in white rats fed on a 20 per cent casein basal diet, a basal diet supplemented with methionine, and a diet containing 40 per cent casein were determined before and after burning with hot water. During the first few days after thermal injury, all animals were in negative nitrogen balance. Neither the addition of methionine nor increased protein ingestion affected the retention of nitrogen significantly." 5 references.

NITROGEN BALANCE (Continued)

445. Cope, O., Mathanson, I. T., Rourke, G. M., and Wilson, H. Metabolic observations. In: Coconut Grove Burns, Phila., Lippincott, 1943. p. 137-158. Also in: Ann. Surg., 1943, 117: 937-958. "Metabolic studies were carried out on 29 of the 39 victims of the Coconut Grove disaster treated at the Massachusetts General Hospital. A complete nitrogen balance was obtained in nine patients, and a potassium balance in six of these. The excretion of 17-ketosteroids in the urine was measured in 23 patients. In one the calcium and phosphorus excretion was determined." 14 references.
446. Co Tui, Wright, A. M., Mulholland, J. H., Barcham, I., and Breed, E. S. The nutritional care of cases of extensive burns; with special reference to the oral use of amino-acids (amigen) in three cases. Ann. Surg., 1944, 119: 815-823. "The nutritional status of three cases of second- and third-degree burns involving, respectively, 10, 30 and 50 per cent of body area, given high caloric and high nitrogen feedings in the form of dextrimaltose and amigen were studied. ... There seemed to be a mathematical relationship between the extent of surface burned and the amount of nitrogen required to maintain nutrition." 8 references.
447. Croft, P. B., and Peters, R. A. Effect of methionine upon nitrogen losses in the urine following severe burns. Nature, Lond., 1945, 155: 175-176. Abstracted in: Biol. Abstr., Balt., 1946, 20: No. 584. Experiments suggest "that methionine might benefit patients suffering from burns, at the stage where the appetite is too poor to allow of ingestion of adequate protein. An amount of 5 gm. per diem has been tolerated." 9 references.
448. Croft, P. B., and Peters, R. A. Nitrogen loss after thermal burns; effects of adding protein and methionine to diet of rats. Lancet, Lond., 1945, 1: 266-272. Abstracted in: Chem. Abstr., 1948, 42: 4654a. "Our object was to determine whether the feeding of high-protein diets to animals would diminish the tissue wastage and loss of nitrogen (N) in the urine following burns, and whether a single amino-acid or a mixture of a few essential amino-acids could replace the total protein." 36 references.
449. Fourrier, P. La protéinémie et l'indication des greffes dermo-épidermiques chez les brûlés graves. Lyon chir., 1951, 46: 366-368. 2 case reports.
450. Glenn, W. W. L., Muus, J., and Drinker, C. K. Observations on the physiology and biochemistry of quantitative burns. J. Clin. Invest., 1943, 22: 451-460. Abstracted in: Biol. Abstr., Balt., 1944, 18: No. 2230. Detailed description of method. "By means of a table and curves, the lymph flow and lymph protein content from normal and burned forelegs of calves are presented. Non-protein nitrogen, urea, creatinine, creatine + creatinine, and amino nitrogen were determined in lymph from a burned area, in lymph from an area remote from the burn, and in serum. The results are presented in tabular form." 18 references.

NITROGEN BALANCE (Continued)

Gribble, M. de G., and Peters, R. A., see No. 214.

451. Gribble, M. de G., Peters, R. A., and Wakelin, R. W. Further experiments upon the effect of methionine on the nitrogen loss after burning. *J. Physiol., Lond.*, 1947, 106: 36P-37P. No effect of methionine upon the course of the N-balance could be demonstrated. Abstract of a paper presented at a meeting of the Physiological Society, June 1947. 3 references.
452. Hirshfeld, J. W., Abbott, W. E., Pilling, M. A., Heller, C. G., Meyer, F., Williams, H. H., Richards, A. J., and Obi, R. Metabolic alterations following thermal burns. III. Effect of variations in food intake on nitrogen balance of burned patients. *Arch. Surg.*, 1945, 50: 194-200. "All the patients excreted large amounts of nitrogen in the urine, and, except for a few who received abnormally large quantities of protein and carbohydrate, were in negative nitrogen balance and lost considerable weight. It was possible to prevent or decrease a negative nitrogen balance and to prevent or diminish loss of weight by feeding diets of high protein and caloric content." 18 references.
453. Hirshfeld, J. W., Williams, H. H., Abbott, W. E., Heller, C. G., and Pilling, M. A. Significance of the nitrogen loss in the exudate from surface burns. *Surgery*, 1944, 15: 766-773. "A method has been described for the quantitative collection and determination of the nitrogen lost in the exudate from a burned surface. Complete nitrogen balance studies have been done on six patients with burns and the percentage of their nitrogen output represented by that from the burned surface has been determined. This varied from 3.0 to 25.47 per cent of the total nitrogen output. Nitrogen continues to escape in significant quantities in the burn exudate until epithelialization has occurred. This is an additional reason for the early skin grafting of large third degree burns." 4 references.
454. Keyser, J. W. Metabolic study of burn cases. *Lancet*, Lond., 1947, 1: 217. Preliminary note regarding an investigation which "had as its principal aim a complete study of the nitrogen balance of burned patients, including the loss of protein in the exudate from the burned area." (See next entry.) 5 references.
455. Keyser, J. W. Metabolic study of burn cases. *Ann. Surg.*, 1948, 127: 605-626. Abstracted in: *Chem. Abstr.*, 1948, 42: 5986b. Urinary nitrogen excretion. - Nitrogen balances. - Nitrogen in the exudate from the burned area. - Plasma proteins. - Creatinine and creatine excretion. - Proteinuria. - Chloride excretion and plasma chloride level. - Blood sugar levels.
456. Large, A., and Johnston, C. G. Proteins as related to burns. In: Sahyun, M. Proteins and amino acids in nutrition. New York, Reinhold, 1948. p. 386-396. "The initial injury results in marked catabolism of nitrogen, the mechanism of which is not clear, and the prevention of which

NITROGEN BALANCE (Continued)

is impossible. The stage of shock is due chiefly to the exudation and seepage of large amounts of fluid rich in protein from and into the burned surface, and is aggravated by the absorption of toxins with resulting liver damage and gastrointestinal disturbances. Lastly, chronic infection is accompanied constantly by depletion of protein reserves, thus not only endangering the life of the patient, but also decreasing the ultimate chance of successful surgical repair and reconstruction of the burned areas."
33 references.

457. Lassner, J. Le métabolisme protéinique et l'anémie des brûlés. Sem. hôp. Paris, 1949, 25: 1173-1177. Negative nitrogen balance and plasma protein deficiency was discussed from a physiological and therapeutical viewpoint. 22 references.
458. Lathe, G. H., and Peters, R. A. Some observations on the comparative effects of cold and burns on protein metabolism in rats. Q. J. Exp. Physiol., Lond., 1949/50, 35: 55-64. Abstracted in: Biol. Abstr., Balt., 1949, 23: No. 20681. "... A study of nitrogen excretion in rats receiving a constant calorie and protein intake on a high fat diet administered by tube. ... Cold and burns produce an increase in nitrogen excretion within 24 or 48 hours. ... A methionine supplement does not reduce ... the excess nitrogen excretion due to burning in the cold." 9 references.
459. Levenson, S. M., Adams, M. A., Green, R. W., Lund, C. C., and Taylor, F. H. L. Plasma alpha amino nitrogen levels in patients with thermal burns. N. England J. M., 1946, 235: 467-471. Abstracted in: Biol. Abstr., 1947, 21: No. 24291. "Plasma or serum alpha amino nitrogen concentrations were elevated in 8 of 12 patients with thermal burns. There was a close correlation among the elevation of the plasma alpha amino nitrogen concentration, the extent of the burn, the degree of shock and the prolongation of the quick prothrombin time." 14 references.
460. Levenson, S. M., Davidson, C. S., Lund, C. C., and Taylor, F. H. L. The nutrition of patients with thermal burns. Surg. Gyn. Obst., 1945, 80: 449-469. "Thirty-two patients with burns were studied with respect to their nitrogen metabolism and their nutritional demands. The nutritional disturbances observed, and especially the increased demand for protein, was found to be directly related to the extent of the third degree burn... The occurrence of late jaundice in burned patients is described and discussed." 49 references.
461. Lund, C. C., Taylor, F. H. L., Levenson, S. H., and Davidson, C. S. Nitrogen metabolism in severe burns. Surgery, 1943, 14: 480. Abstract of a paper read at the Annual Meeting of the American Surgical Association, May 1943, Cincinnati, Ohio.

NITROGEN BALANCE (Continued)

462. Meyer, F. L., Abbott, W. E., and Hirshfeld, J. W. Studies on forced feeding after burns. Fed. Proc., Balt., 1945, 4: 159-160. "Forced feeding in patients improved the state of nitrogen balance but the clinical condition was very poor. The same undesirable effects were produced in two dogs force-fed a diet three times their control diet in protein content and twice the caloric value. ... Blood studies showed a greater increase in plasma volume and decrease in hematocrit than was found in the control animals. Both total protein and albumin concentration showed a decrease..." Abstract of a paper read at the annual meeting of the American Institute of Nutrition, May 1945.
463. Meyer, F. L., Hirshfeld, J. W., and Abbott, W. E. Metabolic alterations following thermal burns. VII. Effect of force-feeding, methionine, and testosterone propionate on nitrogen balance in experimental burns. J. Clin. Invest., 1947, 26: 796-801. Results obtained in 4 groups of 2 female dogs "indicate that force-feeding improved the nitrogen balance, but the treatment was poorly tolerated. There is some indication that testosterone propionate reduces the nitrogen loss following a burn. Methionine seemed to have no beneficial effect on the nitrogen deficit which occurs after a burn." 22 references.
- Picard, J., see No. 393.
464. Rosenthal, O., and McCarthy, M. D. The plasma non-protein nitrogen distribution and its correlation with the efficacy of fluid replacement therapy following thermal injury. J. Clin. Invest., 1947, 26: 827-836. Abstracted in: Chem. Abstr., 1949, 43: 7110e. "... The rise of the undetermined and the amino nitrogen in the plasma of scalded rats is directly related to the severity of the burn. In the present paper it will be shown that the extent to which the increases in these two nitrogen fractions are reduced by therapeutic measures provides an index of efficacy of the fluid and salt treatment." (Largely therapeutic approach.) 11 references.
465. Rosenthal, O., and McCarthy, M. D. Post-burn azotemia, its characteristics and relationship to the severity of thermal injury. Am. J. Physiol., 1947, 148: 365-371. Abstracted in: Chem. Abstr., 1947, 41: 2485h; Biol. Abstr., Balt., 1947, 21: No. 21688. "In view of recent clinical evidence for the existence of a typical post-burn azotemia which is largely due to a rise of the undetermined plasma nitrogen, the non-protein nitrogen partition was studied in the plasma of rats subjected to standard scalds of known lethality." 12 references.
466. Sahyun, M. Protein deficiency in man. Am. J. Digest. Dis., 1946, 13: 59-73. Abstracted in: Biol. Abstr., Balt., 1946, 20: No. 19602. See particularly: Excessive excretion of nitrogen, as in burns, surgery, etc., p. 62-64. 524 references.

NITROGEN BALANCE (Continued)

467. Sellers, E. A., and Best, C. H. Effects of certain diets on the loss of nitrogen in urine after experimental burns. *Brit. M. J.*, 1947, 1: 522-524. "A methionine supplement (1%) to a stock diet did not reduce the urinary loss of nitrogen after burning. When a methionine deficiency existed in the basal diet of young rats, however, a supplement of methionine lowered the nitrogen excretion. ... Cystine ... plus an adequate choline intake was ineffective in reducing the nitrogen loss in young rats. A lysine supplement added to a lysine-deficient diet was also ineffective." 13 references.
468. Sellers, E. A., and Parker, J. M. The effect of closed plaster treatment on the urinary loss of nitrogen after experimental burning. *Canad. M. Ass. J.*, 1946, 55: 41-43. After burns, "increased nitrogen loss occurred, and the non-protein nitrogen level of blood rose, in spite of treatment preventing or markedly alleviating the shock process." 11 references.
- Sellers, E. A., You, S. S., and You, R. W., see No. 228.
469. Taylor, F. H. L. The nitrogen requirement of patients with thermal burns. Wash., 1944. (National Research Council, Blood Substitutes Report No. 39.) 7 p. Also in: *J. Indust. Hyg.*, 1944, 26: 152-155. "This summary report indicates the great need for the nutritional care of patients with thermal burns. ... The success of skin grafting depends in large part on the maintenance of good nutrition. Failure to meet the demands of burned patients for nitrogen have resulted in hypoproteinemia, edema and death from malnutrition." 8 references.
470. Taylor, F. H. L., Davidson, C. S., and Levenson, S. M. The problem of nutrition in the presence of excessive nitrogen requirement in seriously ill patients with particular reference to thermal burns. *Connecticut State Med. J.*, 1944, 8: 141-148. "The criterion for the establishment of increased nitrogen demand are reviewed. The effects of pregnancy, fever, anaemia, malnutrition, nephritis, nephrosis and thermal burns on the nitrogen requirement are indicated. The extent of nitrogen deprivation in these conditions is emphasized. An outline of the method of prevention of the malnutrition of thermal burns is indicated." 16 references.
471. Taylor, F. H. L., Levenson, S. M., Davidson, C. S., and Adams, M. A. Abnormal nitrogen metabolism in patients with thermal burns. *N. England J. M.*, 1943, 229: 855-859. Abstracted in: *Biol. Abstr.*, Balt., 1944, 18: No. 6961. "In a series of burned patients, azotemia was a common complication of severe burns and was usually of the reversible type. ... In some severely burned patients, an irreversible type of azotemia occurred. ... Hypoproteinemia was a common finding in the severely burned patients. ... Inversion of the albumin and globulin ratio frequently occurred." 11 references.

NITROGEN BALANCE (Continued)

472. Taylor, F. H. L., Levenson, S. M., Davidson, C. S., Adams, M. A., and MacDonald, H. Abnormal nitrogen metabolism in burns. *Science*, 1943, 97: 423. "Eleven of twenty-two severely burned patients excreted excessive amounts of nitrogen in the urine. Sometimes as much as 45 grams were excreted within 24 hours" causing a serious nitrogen deficit. 2 references.
473. Taylor, F. H. L., Levenson, S. M., Davidson, C. S., Browder, M. C., and Lund, C. C. Problems of protein nutrition in burned patients. *Tr. Am. Surg. Ass.*, 1943, 61: 215-224. Case report. "Increased nitrogen excretion in the urine of some severely burned patients has been established. Calculable nitrogen deficits, based upon intake and output studies alone, of some duration and great magnitude have been observed." Presented before the American Surgical Association, Cincinnati, Ohio, May 1943. Discussion by L. S. McKittrick, R. Elman, E. A. Graham, Maurot and A. Brunschwig. 7 references.
474. Walker, J., Jr. A study of the azotemia observed after severe burns. *Surgery*, 1946, 19: 825-844. Abstracted in: *Chem. Abstr.*, 1948, 42: 7449; *Biol. Abstr.*, Balt., 1947, 21: No. 16722. "There was a marked rise in plasma non-protein nitrogen within two to six days following thermal burns in seven patients ... due chiefly to an increase in an as yet undetermined fraction. The degree of this rise was of prognostic importance. There was a constant ... increase in the excretion of urinary nonprotein nitrogen, with 30 to 50 per cent of the increase due to the undetermined fraction. ... A considerable depression of the urea clearance during the phase of toxemia ... persisted ... in cases of severe burns until the injured areas were epithelized." 39 references.
475. Walker, J., Jr. Changes in the non-protein fractions of the plasma nitrogen following extensive thermal burns. *Am. J. M. Sc.*, 1945, 209: 413-414. "In a study of the toxemia syndrome in over 100 thermal burns ... the severity of the clinical picture seemed to be closely correlated with the elevation of the plasma non-protein nitrogen ... all ... patients ... in whom the non-protein nitrogen rose to above 100 mg. per 100 ml. of plasma died. Urea nitrogen, uric acid nitrogen, creatinine nitrogen and alpha amino nitrogen were analyzed separately and seldom increased very much. Fifty to 80% of the rise occurred in the undetermined fraction of the non-protein nitrogen. ... Whether any of this undetermined nitrogen represents a toxic factor or whether it is merely a response to tissue injury remains uncertain."

RESPIRATORY SYSTEM

476. Aub, J. C., Pittman, H., and Brues, A. M. The pulmonary complications; a clinical description. *Ann. Surg.*, 1943, 117: 834-840. "In most patients the degree of inhalation burn was by no means ascertainable directly after the fire, and the extreme edema, which occurred later could

RESPIRATORY SYSTEM (Continued)

not be predicted; the resuscitation of patients in acute attacks of edema was difficult and unsatisfactory. ... The pulmonary complications were bizarre and characterized by extreme variability, with areas of lung collapse and emphysema, which were often quite transient and migratory. ..."

477. Cope, O., and Rhineland, F. W. The problem of burn shock complicated by pulmonary damage. *Ann. Surg.*, 1943, 117: 915-928. Contains detailed metabolism studies. 10 references.
478. Department of Health for Scotland. Hospital treatment for burns. 39 p. Edinburgh, H. M. Stationery Office, 1942. (Emergency Medical Services Memorandum No. 8). "Burns of the air-passages": p. 32-33. General outline of treatment.
479. Finland, M., Davidson, C. S., and Levenson, S. M. Clinical and therapeutic aspects of the conflagration injuries to the respiratory tract sustained by victims of the Coconut Grove disaster. *Medicine, Balt.*, 1946, 25: 215-283. Contents: Classification of the respiratory tract complications. - Relation between the surface burns and respiratory damage. - Clinical features of the respiratory involvement. - On the possible causes of the respiratory tract damage. - Therapeutic problems. - Follow-up observations. 31 references.
480. Finland, M., Davidson, C. S., and Levenson, S. M. Effects of plasma and fluid on pulmonary complications in burned patients. *Arch. Int. M.*, 1946, 77: 477-490. Abstracted in: *Biol. Abstr.*, *Balt.*, 1946, 20: No. 19542. 17 references.
481. Finland, M., Ritvo, M., Davidson, C. S., and Levenson, S. M. Roentgenologic findings in the lungs of victims of the Coconut Grove Disaster. *Am. J. Roentg.*, 1946, 55: 1-15. "The roentgen changes were essentially similar to those described by Schatzki and were consistent with the lesions found at autopsy. Most of them could be ascribed to atelectasis and emphysema resulting from a severe membranous laryngotracheobronchitis with obstruction." 5 references.
482. Mallory, T. B., and Brickley, W. J. Pathology; with special reference to the pulmonary lesions. *Ann. Surg.*, 1943, 117: 865-884. 5 references.
483. Moritz, A. R. The effects on the lungs and air passages of extremely hot and extremely cold air. *Bull. N. England M. Center*, 1945, 7: 222-223. "Anesthetized dogs were caused to breathe hot dry and moist air through a transoral cannula. ... The most vulnerable portion of the lung to thermal injury is the central parenchyma."
484. Moritz, A. R., Henriques, F. C., Jr., and McLean, R. The effects of inhaled heat on the air passages and lungs. *Am. J. Path.*, 1945, 21: 311-331. 2 references.

RESPIRATORY SYSTEM (Continued)

485. Pittman, H. S., and Schatzki, R. Pulmonary effects of the Cocoanut Grove Fire; a five-year follow-up study. N. England J. M., 1949, 241: 1008-1009. "From the data on the 16 patients whom we have recently examined clinically and roentgenologically and the 3 additional patients reporting by mail, persistent cough is not reported by any patient and only 3 of the 19 raise any sputum. It seems probably that there is no persisting or secondary pulmonary disease resulting from the fire damage." 2 references.
486. Schatzki, R. Roentgenologic report of the pulmonary lesions. Ann. Surg., 1943, 117: 841-864. "Thirty-five of the survivors of the Cocoanut Grove disaster were examined roentgenologically... Pulmonary pathology was found at some time in 22 patients... The roentgenologic appearance of the lungs was bizarre and varied from patient to patient. The majority of the lesions, however, could be explained by areas of atelectasis and emphysema, both apparently due to bronchial occlusion, particularly of the smaller bronchi. Atypical lesions (miliary nodules, and areas of 'drowned' lung) were seen in a few cases." 11 references.

SKIN

487. Allen, F. M., and Safford, F. K., Jr. Experiments on local hypothermia for treatment of burns and frostbite. Arch. Surg., 1950, 61: 515-523. "For treatment of burns, hypothermia in the form of several hours' immersion in water at reduced temperatures was found beneficial in rats." 53 references.
488. Altmeier, W. A. Hemorrhage complicating cutaneous burn. Cincinnati J. M., 1942, 23: 176-178. Case report.
489. Arzt. Kalkeinlagerungen in Verbrennungsnarbe. Klin. Med., Wien, 1947, 2: 634. Case report. Abstract of a paper read before the Österreichische Dermatologische Gesellschaft in Wien, March 1947.
490. Baxter, H., Stevenson, J. A. F., Schenker, V., and Browne, J. S. L. The effect of different agents on the rate of epithelial regeneration: use of the dermatome donor area in obtaining clinical data. Canad. M. Ass. J., 1944, 50: 411-415. "In many respects, the dermatome donor site resembles an uninfected second degree burn, and, since the variables of depth and site may be so easily controlled, it forms an experimental wound from which much can be learned about the value of various agents in the treatment of burns." 5 references.
491. Beck, J. S. P., and Meissner, W. A. Atomic bomb surface burns; some clinical observations among prisoners of war rescued at Nagasaki, Kyushu. J. Indiana M. Ass., 1947, 40: 515-521. "Rays from the activated atomic bomb produced first, second, and third degree thermal burns of the skin. The distribution of the burns was influenced by the position of the body and the wearing

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- apparel of the victim at the time of exposure. The depth variations of the burns on a given area of the body were correlated with the surface anatomical features and the incidence of the rays."
492. Beloff, A., and Peters, R. A. An investigation for the presence of a skin protease inhibitory factor in burned skin. *J. Physiol., Lond.*, 1946, 105: 54-57. Abstracted in: *Biol. Abstr.*, Balt., 1947, 21: No. 2766. "No protease inhibitor can be recovered from the burned skin of the rat. The decrease in proteolytic activity of skin after burning is mainly due to escape of the enzyme into the circulation." 4 references.
493. Beloff, A., and Peters, R. A. Observations upon thermal burns; the influence of moderate temperature burns upon a proteinase of skin. *J. Physiol., Lond.*, 1944/45, 103: 461-476. Abstracted in: *Biol. Abstr.*, 1945, 19: No. 15615. "The presence of a proteolytic enzyme has been demonstrated in human, rat, guinea-pig and rabbit skin. ... The behaviour of the 'skin proteinase' has been followed after burns at temperatures varying from 54 to 65° C. for 1 min. Though these temperatures produce little change in the activity of the enzyme through heat inactivation, there is a decrease in the proteinase content of the skin due to burning. At 60° C. this reaches an average of 54% in 2 hr. and at 54° C., 33%. ... The relation of the proteinase to 'burn toxin theories' is discussed." 34 references.
494. Best, R. R., Coe, J. D., and McMurtrey, G. E. The effect of soaps containing hexachlorophene on wounds and burned surfaces. *Arch. Surg.*, 1951, 62: 895-902. Abstracted in: *Chem. Abstr.*, 1951, 45: 8653g. "Histol. evidence indicates that the presence of 2% hexachlorophene in bar soap (dild. with equal parts of water) exerts no influence on the amt. of tissue reaction. Wound healing was not delayed. Liquid soap contg. alc. showed a more marked tissue reaction but was more effective against pathogens. Hexachlorophene soap is preferable to tincture of green soap for washing wounds." (Chem. Abstr.).
495. Block, M. A., and Tsuzuki, M. Observations of burn scars sustained by atomic bomb survivors; a preliminary study. *Am. J. Surg.*, 1948, 75: 417-434. "A relatively high incidence of scar keloid and hypertrophic scar formation of a severe degree has occurred after healing of flash burns that probably were of deep second or third degree severity..." 54 references.
496. Bocage, A., Perthain, E., and Pelletier. Cicatrices hypertrophiques nodulaires en nappe après brûlures. *Bull. Soc. fr. derm. syph.*, 1948, 55: 21-22. Case report.
497. *Borras, J. A. Degeneración cancerosa de una cicatriz por quemadura, a los cincuenta años del accidente. *Med. españ.*, 1951, 26: 231-234.
- Braithwaite, F., and Moore, F. T., see No. 22.

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498. Brush, B. E., Lam, C. R., and Ponka, J. L. Wound healing studies on several substances recommended for the treatment of burns. *Surgery*, 1947, 21: 662-667. "A number of substances which have been suggested or recommended for the treatment of burns have been applied locally to small wounds in guinea pigs and the healing time compared with that of control wounds in the same animal which were treated with dry gauze. Tannic acid in solution and in jellies caused a marked delay in healing. Proflavine dihydrochloride (1:1000) and hydrosulphosol were moderately inhibitory. Biodyne ointment and two kinds of carbowax base gave slight delay in one-half the animals. Wounds dressed with petrolatum gauze and a stearate grease healed in the same time as the controls." 17 references.
499. Buettner, K. Effects of extreme heat and cold on human skin. II. Surface temperature, pain and heat conductivity in experiments with radiant heat. *J. Appl. Physiol.*, 1951, 3: 703-713. "The surface temperature of human skin, irradiated with strong infrared radiant heat, was observed. The skin reaches its pain point within 2 to 60 seconds, depending on radiation intensity and on the initial skin temperature. ... The pain threshold temperature and the depth of pain receptors in the skin are 44.8° C. and 0.1 mm., respectively. From our data the heat conductivity of the upper skin can be derived. ... Additional experiments concern heat burns... Pre-cooling the skin seems to offer an effective protection against overheating." 19 references.
500. Bull, J. P., and Lennard-Jones, J. E. The impairment of sensation in burns and its clinical application as a test of the depth of skin loss. *Clin. Sc., Lond.*, 1949, 8: 155-167. "A standard method for the study of pain sensation in normal skin and experimental burns is described. ... In general partial thickness burns, both experimental and clinical, showed moderately diminished pain sensibility. In full thickness burns, on the other hand, the pain sensibility was greatly reduced or completely absent." 7 references.
501. Caccialanza, P. Il comportamento dei fenomeni di diffusione nei focolai di ustione della cute umano. *Boll. Soc. ital. biol. sper.*, 1943, 18: 83-84. Abstract of a paper read at the Meeting of the Società italiana di biologia sperimentale, Sezione di Modena, February 1943.
502. Cannon, B., and Cope, O. Rate of epithelial regeneration; a clinical method of measurement, and the effect of various agents recommended in the treatment of burns. *Ann. Surg.*, 1943, 117: 85-92. Various agents recommended for treatment of debrided burn surfaces were tested by application to "the donor area from which a skin graft of uniform thickness has been cut with the dermatome." 12 references.
503. Cantor, H. Cancer following burn scars. *Virginia M. Month.*, 1948, 75: 197-199. 7 references.

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504. Carrasco, C. Queimaduras. As grandes funções cutâneas ofendidas. Clin. hig. and hidr., Lisb., 1944, 10: 50-54.
505. Connor, G. J., and Harvey, S. C. The healing of deep thermal burns; a preliminary report. Tr. Am. Surg. Ass., 1944, 62: 362-366. Also in: Ann. Surg., 1944, 120: 362-366. "In the experimental laboratory it has been found that the normal development of a plan of cleavage between living and dead tissues can be markedly accelerated by the use of acids. With certain of the organic acids, in the proper concentration, and with a carefully and suitably adjusted pH this can be accomplished without significant injury to viable tissues. This makes it possible in the experimental animal to remove the slough resulting from a severe burn in 48-72 hours, and to employ immediate skin grafting for the closure of the wound." 3 references.
506. Converse, J. M., and Robb-Smith, A. H. T. The healing of surface cutaneous wounds; its analogy with the healing of superficial burns. Ann. Surg., 1944, 120: 873-885. "In the study of superficial burns, a comparative study of 500 donor areas of partial thickness skin grafts were done" and the results were studied. Further, "from 191 burned patients, 63 biopsy specimens were removed" and investigated. "A description of the clinical and pathologic aspects of superficial burns is given." 4 references.
507. Cucinotta, U. Altre ricerche sui fenomeni allergici nelle ustioni. Riv. pat. clin., Parma, 1950, 5: 187-197. Hypersensitivity of the skin is found in laboratory animals after burns. 5 references.
508. Davies, J. N. P., Kadama, I. S., and D'Souza, T. Pemphigoid eruption following burns. East Afr. M. J., 1946, 23: 115-117. Report of a case offering "a very interesting example of the localisation of a skin eruption in previously traumatised areas of skin." 5 references.
- Dérobot, and Gascoin, see No. 397.
509. Elman, R., and Lischer, C. The local skin lesion in experimental burns and its relation to systemic manifestations. Surg. Gyn. Obst., 1944, 78: 346-349. "Experimental thermal injuries are described and the production of 3 types of skin damage, i.e., edema, wet necrosis, dry necrosis, with variations in the intensity and duration of the burn stimulus as well as with the cooling effect of blood flow are correlated. The importance of differentiating wet and dry necrosis in human burns is discussed and evidence is presented suggesting that the former lesion may produce 'toxic' manifestations." 2 references.
510. Evans, E. I., Hoover, M. J., and James, G. W., III. The absorption of sulfonamides from the burn surface. Surg. Gyn. Obst., 1945, 80: 297-302. "These studies indicate that the absorption of sulfonamides from the burn surface is limited when oil base ointments are employed. In contrast, when a water dispersible base is used toxic blood levels of the drug may occur." 8 references.

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511. Glenn, W. W. L. A physiologic analysis of the nature and of the treatment of burns. *Ann. Surg.*, 1944, 119: 801-814. Abstracted in: *Prensa méd. argent.*, 1945, 32: 1298-1300. Includes: The general nature of a burn of the skin. - Special changes in burns. 1. The epithelium. 2. The vascular lesion. 33 references.
512. Glover, D. M., and Kiehn, C. L. Marjolin's ulcer; a preventable threat to function and life. *Am. J. Surg.*, 1949, 78: 772-780. Report of 7 cases. 16 references.
- Gordon, J., Hall, R. A., Heggie, R. M., and Horne, E. A., see No. 356.
- Ham, A. W., see No. 61.
513. Hogg, L., Payne, J. T., and Pearse, H. E. Experimental flash burns; the pathologic aspects. *Arch. Path., Chic.*, 1950, 49: 267-277. Abstracted in: *Fed. Proc., Balt.*, 1949, 8: 358; *Bull. Anal. CNRS*, 1950, 11: pt. 2, 2493. "Experimental flash burns were produced on swine by exposing the animals to the heat of burning magnesium flash powder. The burns were characterized on histologic section by abrupt demarcations laterally and horizontally. The lesions healed by sequestration or organization of the burned tissues. The cutaneous blood vessels beneath the burns retained reactivity, so that erythema and edema were prominent."
514. Howes, E. L. Recent advances in studying the problems of healing and their effect on the treatment of wounds and burns. *N. York State J. M.*, 1944, 44: 2006-2011. Short review. Paper read at the Annual Meeting of the Medical Society of the State of New York, May 1944. 17 references.
515. Kozdoba, A. Z. Zazhivlenie ozhogov pri avitaminozakh i gipovitaminozakh A, D, i C; eksperimentalnoe obosnovanie vitaminoterapii ozhogov. [Healing of burns in A, D, and C avitaminoses and hypovitaminoses; experimental analysis of vitamin therapy in burns.] *Khirurgia, Moskva*, 1942, No. 10, 52-57. Nutrition in general, particularly vitamin contents, is an important factor in the biologic processes in the healing of burns. Cicatrization of burns in A avitaminosis and hypovitaminosis is slower (20-44 days) than in the control animals. D avitaminosis and hypovitaminosis slows down the healing process by 8-24 days. C avitaminosis has a sharp deteriorating effect on the regenerative processes. Necrobiotic processes prevail in the traumatic area.
516. Lam, C. R., and Puppenthal, M. The pyruvic acid method of burn slough removal; an experimental investigation. *Ann. Surg.*, 1945, 121: 866-871. Abstracted in: *Biol. Abstr.*, *Balt.*, 1945, 19: No. 22267. Dog experiments. "Early sloughing was produced by dressing the small third-degree burns with pyruvic acid in starch paste, plain 8 per cent

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starch paste, tragacanth jelly and cotton wet with distilled water. The only common factor appears to be the 'wetness.' It is suggested that the favorable effect on sloughing obtained with pyruvic acid paste is due more to maceration than to pH. A dry gangrene has been converted to a wet one." 1 reference.

Leach, E. H., Peters, R. A., and Rossiter, R. J., see No. 174.

517. Loeffler, R. K., Herron, J. W., and Thomas, V. A quantitative study of percutaneous absorption. IV. Absorption of minute quantities of radiostrontium chloride through burned rat skin. San Francisco, 1951. (U. S. Nav. Radiol. Defense Lab., Report AD-308(B).) 29 p.

McCleery, R. S., Schaffarzick, W. R., and Light, R. A., see No. 76.

518. Macomber, W. E., and Trabue, J. C. Marjolin ulcer case reports. Plastic and Reconstr. Surg., 1951, 7: 152-156. Report of 3 cases. "Marjolin ulcers should be prevented by giving adequate initial treatment to acute burns and grafting these burns at the earliest possible time, eliminating the formation of thick avascular vulnerable scars. ... Cancer does develop in burn scars. Any chronic ulcer should be considered malignant until proven otherwise." 10 references.

519. Maun, M. E., Schneider, R. C., Pilling, M. A., and Hirshfeld, J. W. Tissue reactions to medicaments used in the local treatment of burns. Surgery, 1943, 14: 229-238. "In order to test ... the medicaments used in burn therapy we placed them on prepared donor sites of dogs, and we have been able to study the reactions of normal tissue to the medicaments in serial biopsies. ... The demonstration that most of the agents commonly employed in the treatment of burns have the ability to destroy normal tissues and thereby increase the depth of the burn, demands that one question the wisdom of employing them." 8 references.

520. Moore, F. D., Evans, R. D., and Ball, M. R. The histochemistry of burned human skin. Ann. Surg., 1948, 128: 266-282. Abstracted in: Chem. Abstr., 1949, 43: 14776. "The histochemical changes in burned human skin are described. The established histochemistry of skin and muscle are contrasted with respect to their potential for cation transfer. From these data, observed and calculated, we may conclude that, following burns, the entrance of sodium into skin cells is evidence of cell death; it is an alteration in tissue chemistry of great local significance. From the viewpoint of the total organism, however, such alterations impose little sodium deficit and no discernible potassium excess. Were similar changes to occur in skeletal muscle, massive electrolyte transfer would seriously alter the chemical composition of both intracellular and extracellular fluid, and endanger survival." 14 references.

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521. Moritz, A. R. Studies of thermal injury. III. The pathology and pathogenesis of cutaneous burns; an experimental study. *Am. J. Path.*, 1947, 23: 915-941. Abstracted in: *Biol. Abstr.*, 1948, 22: No. 8428. Experiments with human and porcine skin. "The transfer of heat to the skin at a rate sufficiently great to raise the subsurface temperature to an appreciably higher level than that which is normal for the organism leads to a series of local reactive and alterative changes, the severity of which bears a direct relationship to the degree and duration of the temperature rise. The nature of the change that occurs at any given depth below the surface of the exposed skin is determined in part by the intensity and duration of the temperature rise at that level and in part by the nature of the affected tissue." 5 references.
522. Moritz, A. R., and Henriques, F. C., Jr. The reciprocal relationship of surface temperature and time in the production of hyperthermic cutaneous injury. *Am. J. Path.*, 1947, 23: 897-898. "The threshold for the occurrence of irreversible epidermal injury at surface temperatures varying between 44 and 100° C. was observed in porcine and human skin. ... The time required to produce irreversible injury bore an inverse relationship to temperature. The effect of circulation of blood through the dermal capillaries on the susceptibility of the skin to thermal injury was investigated. ..." Abstract of a paper read at the Forty-fourth Annual Meeting of the American Association of Pathologists and Bacteriologists, May 1947. Discussion by R. H. Rigdon and H. Lund.
523. Moritz, A. R., and Henriques, F. C., Jr. Studies of thermal injury. II. The relative importance of time and surface temperature in the causation of cutaneous burns. *Am. J. Path.*, 1947, 23: 695-720. 8 references.
524. Murakami, T. Kasyo hanryo gan (syorei hokoku bunken ni yoru tokii kansatu). [Burn cancer; case reports and statistical reviews of literatures.] *Rinsyo geka*, 1949, 4: 291-298. The author reviews 9 cases of his own and 116 cases taken from the literature. Detailed data are presented: Sex, occupation and age of patients; location of burn and time interval; condition of burn scar; location of cancer and metastases; metabolic studies; prognosis and pathogenesis. The development of the cancer is due to circulatory disturbances originating in the local scar. 13 references.
525. Nieldelman, M. L. Fibrosarcoma protuberans. *Ann. Surg.*, 1946, 123: 311-314. Case report. 3 references.
- Patey, D. H., and Scarff, R. W., see No. 181.
526. Patey, D. H., and Scarff, R. W. Treatment of burns with partial skin destruction. *Lancet*, Lond., 1945, 1: 146. "In a burn with only superficial necrosis of the dermis, the follicular and glandular structures are all present and capable of re-epithelialising the raw area. They

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cannot do so however until the superficial layer of coagulation necrosis has been cast off, a slow process accompanied by inflammatory and subsequent fibrotic changes in the dermis." 3 references.

Perdrup, A., see No. 197.

527. *Piera, A. Traitement, par la méthode de Charpy, d'un cas de chéloïdes récentes et étendues, consécutives à une brûlure. Cah. méd. Alger, 1950, 5: 719-720. Description of keloid formation following burns.*
528. *Ranque, J. Un cas de vaste épithélioma développé sur une ancienne brûlure. J. radiol. électr., 1950, 31: 91-92. Case report.*
529. *Rhode, C. M., Morales, M. F., and Lozner, E. L. Studies on the quantitative evaluation of certain treatments in the healing of experimental third degree burns. J. Clin. Invest., 1945, 24: 372-379. In burned rabbits, coagulated plasmasulfonamide film was not superior to other agents. Surgical excision shortened the healing time. "The curve of healing of both control and excised burns follows the growth curve of a homogeneous cell colony with high precision." 14 references.*
530. *Riveros, M. Quemaduras cutáneas. An. Fac. cienc. méd., Asunción, 1948, 3: 7-68. Contents include: Conceptos dominantes sobre quemaduras. Interes de un tratamiento local adecuado. Diversas fases del problema. - Clínica. - Anatomía patológica. - Síndrome humoral. - Teorías etiopatogénicas. 30 case reports, partly with detailed laboratory and pathological findings. 64 references.*
531. *Roback, R. A., and Ivy, A. C. The therapy of burns; a comparative experimental study including a medicated pliable gelatin film, and a note on the effect of firm dressings on the rate of healing. Surg. Gyn. Obst., 1944, 79: 469-477. "A uniform sized excoriation wound, an excision wound, and third degree burn was made on each side of the back of dogs. The effect of several medicated preparations on healing was compared by placing one of the preparations over the wound on one side of the back and another over the wound on the other side of the back." 15 references.*
532. *Schavelzon, J. Cicatriz retractil por quemadura. Bol. Soc. argent. cir., 1949, 10: 517-518. Case report; facial contracture.*
533. *Silva, M. S. Câncer das cicatrizes. Rev. brasil. cancer., 1947, 1: 67-77. The authors report 10 cases "calling the attention upon the small percentage of metastases and the greater frequency of well differentiated spindle cell carcinomas comparing with the other types." English abstract.*

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534. Smelser, G. K., and Ozanics, V. Effect of chemotherapeutic agents on cell division and healing of corneal burns and abrasions in the rat. *Am. J. Ophth.*, 1944, 27: 1063-1073. Abstracted in: *Biol. Abstr.*, Balt., 1947, 21: No. 3340. "Thermal burns became covered with epithelium in about ... 12-18 hours, but a great increase in the number of mitotic figures was found during this procedure. ... Sulfonamides and penicillin did not interfere with cell division in burned corneal epithelium. Sulfathiazole and sulfacetimide inhibited cell migration following corneal burns, whereas sulfadiazine and penicillin were but slightly detrimental." 14 references.
535. Tiso, M. Epiteliomi cutanei su pregresse cicatrici da ustione. *Riv. infort. mal. profes.*, 1950, 37: 120-147. Etiological and pathogenic considerations. - Clinical types of burn scar epithelioma. - Clinical characteristics of burn scar epithelioma; their diagnostic value. - Reports of 11 cases. - French, English, Spanish and German summaries. 29 references.
536. Touraine, A., and Balter. Épithélioma baso-cellulaire sur brûlure par corps gras. *Ann. dermat. syph.*, Par., 1944, 4: 319-320. Abstract of a paper read at a meeting of the Société de Dermatologie et de Syphillographie, December 1944.
537. Vachon, R., and Montbarbon. Vaste cancer développé sur cicatrice de brûlure par la foudre. *Lyon méd.*, 1948, 179: 240. Case report.
538. Vicentini, F. Epitelioma dopo ustione su cicatrice da ustione. *Sperimentale*, 1949, 99: 501-504. Case report.
539. Walker, J., Jr. The pathologic physiology of the extensive superficial burn. *Surg. Clin. N. America*, 1946, 1488-1497. 53 references.
540. Wvns, G. Kystes épidermiques après brûlure. *Arch. belg. dermat. syph.*, 1951, 7: 120. Illustration; no text.

SPLEEN

Baker, R. D., see No. 404.

541. Mukhin, I. A. Pervichnyi ozhogovoi shok. [Primary thermal shock.] *Khirurgia*, Moskva, 1947, 1: 30-40. From 2 series of dog experiments (with and without narcosis) the conclusion is drawn that burns lower splenic resistance (the spleen contains a large amount of blood not taking part in the general circulation) and that any pain stimulus further reduces splenic activity.

SYSTEMIC EFFECTS (including shock)

542. Amorati, A., Mucci, E., and Troisi, F. M. Indagini sugli effetti tecnopatici in lavoratori dell'ambiente caldo-umido (operai dei pastifici). *Med. lavoro*, 1950, 41: 257-267. Abstracted in: *Bull. Anal. CNRS*, 1951, 12: pt. 2,

SYSTEMIC EFFECTS (Continued)

1589. "The Authors have examined a group of 100 individuals, working in a hot and damp surrounding (machine department in alimentary paste factories), their researches having been accomplished in two separate stages: clinical examination and some laboratory test of liver and kidneys functionality. ... About one third of the individuals ... are affected by moderate thermo-pathological conditions which, though not such as to impair the working efficiency of the subjects, still called for medical care and treatment." 17 references.
- Antos, R. J., Dworkin, R. M., and Green, H. D., see No. 421.
543. Attalla, S. L'effet des injections d'antergan, d'atropine, d'histidine sur l'évolution des brûlures chez le cobaye. 24 p. Genève, 1948. Thèse-Univ. Genève. 14 references.
544. Bergman, H. C., Hechter, O., and Prinzmetal, M. Effect of short-term nutritional stress upon resistance to scald shock. Am. Heart J., 1945, 29: 513-515. "... When dehydration is prevented, short periods of stress due to fasting or a poor nutritional regimen do not significantly reduce the resistance of mice subjected to thermal injury." 1 reference.
545. Bergman, H. C., and Prinzmetal, M. The antishock action of certain drugs in burned mice. J. Laborat. Clin. M., 1946, 31: 663-671. Abstracted in: Biol. Abstr., Balt., 1947, 21: No. 5718. "Sodium pentobarbital, morphine, histamine, acetone, glycerol, and propylene glycol [if injected beforehand] display antishock activity similar to that of ethanol. These substances increase survival time and diminish mortality in mice subjected to a standardized thermal injury." The mechanism of action of these drugs was investigated. 16 references.
546. Bergman, H. C., and Prinzmetal, M. The antishock action of ethanol in burned mice; effect on edema formation and capillary atony. J. Laborat. Clin. M., 1946, 31: 654-656. Abstracted in: Biol. Abstr., Balt., 1947, 21: No. 5717. Evidence is presented to the effect that ethanol "increases survival time and diminishes mortality in mice subjected to scald shock ... the mechanism whereby ethanol retards the development of shock" is investigated.
547. Bergman, H. C., and Prinzmetal, M. Influence of environmental temperature on shock. Arch. Surg., 1945, 50: 201-206. "The optimal environmental temperature range for highest survival of mice in burn shock was found to be 65 to 71 F. In a hot environment, the increased mortality in shock is due to a further decrease in the effective circulation and an increase in capillary congestion caused by the toxic factor. In shocked mice kept in a cold environment, an increased bleeding volume and a reduced degree of capillary atony were found when compared with values obtained in an environment with ordinary room temperature." 14 references.

SYSTEMIC EFFECTS (Continued)

548. Bergman, H. C., Rosenfeld, D. D., Hechter, O., and Prinzmetal, M. Ineffectiveness of adrenocortical hormones, thiamine, ascorbic acid, nupercaine, and posttraumatic serum in shock due to scalding burns. *Am. Heart J.*, 1945, 29: 506-512. "The therapeutic activity against shock due to a standardized scalding burn in rats and mice has been ascertained for the following substances: desoxycorticosterone acetate, adrenal cortical extract, thiamine, ascorbic acid, nupercaine, and posttraumatic convalescent serum. It was found that none of these agents possessed significant antiscald shock activity when tested on a sufficient number of animals under controlled conditions." 29 references.
549. Berman, J. K., Peterson, L., and Butler, J. The treatment of burn shock with continuous hypodermoclysis of physiological saline solution into the burned area. *Surg. Gyn. Obst.*, 1944, 78: 337-345. "Isotonic sodium chloride solution injected hypodermically into the burned area in experimental animals curtails the loss of plasma and electrolytes, makes possible the dilution and excretion of hypothetical toxins, controls body temperature, prevents pulmonary edema and anuria. As a result of these effects survival time is considerably increased in the treated animals." 14 references.
- Bosse, M. D., Gross, P., and Hagan, M. L., see No. 20.
550. Bravo Asenjo, J. Tratamiento del "shock" producido por quemaduras. *Farmacoter. actual, Madr.*, 1948, 5: 417-421. See particularly Fisiopatología del shock, p. 417-419. 22 references.
551. Buonomo la Rossa, B. L'azione degli antistaminici sullo shock secondario da scottature. *Rass. internaz. clin. ter.*, 1949, 29: 328-332. In the guinea pig, synthetic antihistamines diminish edema; this confirms the hypothesis that histamine or histamine-like substances are responsible for secondary burn shock. 8 references.
552. Carey, E. J., Massopust, L. C., Zeit, W., and Haushalter, E. Studies on ameboid motion and secretion of motor end-plates. VII. Experimental pathology of the secretory mechanism of motor end-plates in thermal shock. *Am. J. Path.*, 1946, 22: 175-233. "Whole-mount specimens of the gastrocnemius muscle and the motor end-plates from 250 rats subjected to thermal shock produced by water immersion (except the head and neck) at 75° to 90° C. for 1 to 10 seconds, were studied by the gold and teasing method." The sequence of histological changes is described. 74 figures. 19 references.
553. Cerda G., G. Problemas nutritivos en los quemados. *Bol. Clín. Martínez Villarreal, Monterrey*, 1946, 2: 73-79. Nutritional disorders following burns are described. 8 references.

Cope, O., and Rhineland, F. W., see No. 477.

SYSTEMIC EFFECTS (Continued)

554. Debie, P., Lafontaine, A., and Willot, W. Influence des régions brûlées sur l'état général chez la grenouille. Arch. internat. pharm. dyn., Par., 1946, 72: 287-293. 10 references.
555. Dekanski, J. The effect of cutaneous burns on histamine in mice. J. Physiol., Lond., 1945, 104: 151-160. "Extensive cutaneous burns in mice caused the new formation of histamine, mainly in the skin, so that the total amount of histamine in the mouse was almost doubled in 10 min. This excess histamine was mostly excreted in the urine during the next 48 hr., if the mice survived. The relation of this phenomenon to shock following burns is discussed." 28 references.
556. Dekanski, J. The effect of severe burns and some protein-precipitants on skin-histamine in cats. J. Physiol., Lond., 1947, 106: 33-41. Abstracted in: Biol. Abstr., 1948, 22: No. II67. "Small areas of cat's skin were burned under anaesthesia and then extracted with trichloroacetic acid. After moderate burns (60° C.) the histamine equivalent increased in the burned area. After severe burns (80° C. and 140° C.) the histamine originally present slowly disappeared." 11 references.
557. DesMarais, A. Contribution à l'étude du shock. Laval méd., 1949, 14: 346-379; 443-476. A comprehensive review precedes the report on experimental work with rats presented under the following headings: I. Fonction hépatique, facteur de résistance aux brûlures. A. Hépatectomie partielle et résistance aux brûlures. B. État comparé des hépatectomisés et des témoins, après l'opération. C. Influence des brûlures sur la régénération et le taux de matières sèches du foie après hépatectomie partielle. II. Rôle du foie dans la résistance aux brûlures. A. Hépatectomie partielle et résistance aux brûlures aux cours du jeûne. B. La glycémie après les brûlures. C. L'azote α -aminé du sang total après les brûlures. D. L'acide ascorbique et le poids des surrénales après les brûlures.
558. Desmet, J. Nouvelles recherches sur l'influence des régions brûlées sur l'état général de la grenouille. Arch. internat. pharm. dyn., Par., 1949, 79: 357-361. Abstracted in: Bull. Anal. CNRS, 1950, 11: pt. 2, 459. Frogs survive normally fatal burns of their hind-legs if these are properly ligated (500-5000g). 2 references.
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